REMARKS

Applicant notes with appreciation that the Examiner has indicated that claims 123, 128-131, 133, 134, 137, 148, 156, 159 and 161 are allowed. These claims have been renumbered in the present amendment as claims 166, 175-178, 180, 181, 184, 195, 203, 207 and 209, respectively, in order to maintain a consecutive numbering of the claims. Applicant anticipates that the Examiner will continue to hold these claims as allowed.

Applicant objects in most other parts to the Office Action dated August 4, 2003, as the examination was based on misunderstandings. Therefore Applicant respectfully requests that the Examiner review the claims and remarks presented in this amendment. Since Applicant is rewriting the claims as new claims 165-212, a chart is enclosed **(enclosure 3)** which illustrates the differences between these new claims and the claims as they were last examined. A further chart is enclosed **(enclosure 4)** illustrating the differences between the examined claims and the claims as previously presented in the application.

1. Comments on single points in the note:

Concerning point 1:

There was a misunderstanding concerning the groups:

It was assumed that with the submission of new generic claims these would be examined for all inventions. This exception was expressed in Applicant's amendment filed April 17, 2003, page 16, line 4-5.

Apart from that, problems could arise from grouping the inventions into only 16 groups.

In fact there are more than 16 (groups of) inventions in this patent application. Each figure shows aspects of the invention, which also forms an inventive machine together with different construction forms.

The groups which should be examined first (apart from the 16 groups) form the generic claims and relate to the design of the air gap in relation to the air coil in section across the moving direction. This invention is included in several of the 16 groups.

To facilitate the examination Applicant indicated the corresponding group resp. drawing for each claim, in which the invention is shown. **(enclosure 2)**

Applicant put in an application for the generic claims of the new claims for the indicated groups to be examined.

All generic claims are founded on one invention idea, which is based on the ideal conditions being implemented in a highly efficient electrical machine. These ideal conditions are not taken into consideration in their entirety in the development of machines nowadays.

A misunderstanding concerning edge 10:

The examination showed, amongst other points, that there is a misunderstanding concerning edge 10, which could not be cleared up by picture 2 in the **enclosure 1 (attached)**.
This misunderstanding led to a wrong assessment of generic claims 122, 124 and 125 as well as most rejected subordinate claims.

To make things clear the distinction of the aspects of the edge 10 was taken over into the new claims 165-212. According to these claims, edge 10 can have different forms, expressed more clearly: bordering- or corner edge 10 and an outer edge 28. The reference numeral 28 has been added to Figs. 1, 3, 5, 9, and 27 on the amended Figures submitted with this amendment to clarify the area of the edge referred to. The specification has also been amended at appropriate locations to reflect this clarification.
At the **bordering- or corner edge 10** both boundary surfaces belonging to the first body can border at each other directly in two different ways, founding a bordering- or corner edge 28:

1. with the boundary surfaces bordering at each other (jointly), contacting each other and blending into each other, with the contact point in a 180° angle (**picture 1, enclosure 1**).
   (see Fig.14,36,8 and Specification, page 8, line 3-8, P.10, line 1-7, page 14, line 23-33, page 16, line 21-25, page 18, line 5-11, line 23-29, claim 23,35,38,40,14,13 from June 13, 2000)

2. with the boundary surfaces intersecting each other, forming a corner (**picture 2, enclosure 1**)
   (see Fig. 24,22,4,29,31, claims 11,12,14,15,18,32,34-40, Specification, page 7, line 19-22, page 7, line 26-28, if they form a corner edge)

In both cases, the boundary surfaces intersect each other, forming a corner (bordering- or corner edge 10). In both cases, the air coil at the edge (bordering- or corner edge 10) changes its geometrical form in the area of the intersection point of the boundary surfaces, like in

picture 1, enclosure 1 from a curved form into a straight form and in **picture 2, enclosure 1** from a straight form into a very short curved and again into a straight form.
Geometrical form means forms like a circular form, arcs, straight lines, circular arcs.

A machine with a bordering- or corner edge makes a change of direction of the air coil possible, in section across the moving direction, with the area of the coil side (running through the field-free space, in the transition region from one air coil section to the neighboring one) being very short. This means that losses (electrical and mechanical) are minimal, increasing the efficiency of the machine and giving the machine a favorable and compact form. This positive effect will be even bigger if arc-shaped (curved) air gap sections are used.
(Specification page 4, line 15-34, page 5, line 1-25, page 5, line 30-34, page 6, line 1-8, page 22, line 18-34, S.23, line 1-12)

At the **outer edge 28** not only neighboring air gap sections border at each other with their boundary surfaces directly (contacting each other directly, like the bordering- or corner edge), but also the boundary surfaces of the air gaps are relatively close to each other in the outer areas of the surfaces (Fukami (US 4,604,540) and Oba (JP 55-083,449) have them lying further apart) and are connected with a short edge (see outer edge 28). The air gap sections are positioned left and right to the outer edge. Fukami and Obi have the coil folded or curved around the outer edge, but it is outside the air gap resp. the air gap sections (**picture 3, enclosure 1**).

Concerning point 3:

The title of the invention has been changed to read:
Highly Efficient Electrical Machine With A Bent And/Or Folded Air Core Coil, Without Contact To Iron, Between Two Magnetic Bodies, in accordance with the requirement set forth by the Examiner.

Concerning point 5:

In claim 122 it must be "every coil side".

The new claim 167 (old claim 124) was supplemented to provide an antecedent basis for the limitation (restriction) of claim 174 (old claim 127).

Concerning point 7:

The assessment of claim 122 is based on a misunderstanding concerning the air gap boundary surfaces (angular to each other), resp. the edge 10 (now outer edge 28).
This is not, as it was assumed by mistake, the whole boundary surface of the first body, but parts of this boundary surface, neighboring each other, each belonging to an air gap section. The characteristic feature of an air gap section is that it is formed out of two boundary surfaces facing each other, with a magnetic field between them, with at least one boundary surface with magnetic poles, of which the magnetization direction runs to the opposite boundary surface. In **picture 1, enclosure 1 dated April 17, 2003**, the areas between the air gap sections do not belong to the air gap. In **picture 3, enclosure 1** of this writing showing two parallel air gap sections connected by a short outer edge 28, the outer edge does not belong to the air gap as well. The same goes for the outer edges at Oba (JP 55-083,449), meaning the girth sides of the axial magnetized magnets. Looking at Fukami (US 4,604,540) we see the same; the neighboring boundary surfaces 18a and 18b (in fig. 6) are connected to each other by an outer edge, which is not penetrated by the field.
With the edge 10 in claim 122 a bordering and corner edge is meant, which is formed by the two neighboring boundary surfaces being positioned angular to each other.(concerning point 1)
The invention in claim 122 is new and inventive and not obvious for a person of ordinary skill. This means the machine can work highly efficient with two straight air gaps lying in a acute angle to each other, which include a lenticular first body and which is included in claim 200 (old claim 153). Further changes are described in the claims 202, 204, 205, 112, (old claims 155,157,158,164)).

The assessment of **claim 125** is based on a misunderstanding concerning the speed of the single coil sides. Here, it does not say that both coil sides have the same speed like under point 8 (Fukami (US 4,604,540)), but that there are sections within one coil side which have

the same speed, for example if they run on the same radius (as shown in fig.27). This is a very space-saving variant which includes a lot of conductor material in the high speed area, and that with a high effectiveness of the conductor in the coil. The invention in claim 125 is new and inventive and not obvious for a person of ordinary skill. (Specification, page 19, line 9-16, page 21, line 4-14)

The content of **claim 126** is known, but not in connection with the content of claim 124, which is also new and inventive.

Claim 144 has been expressed more clearly according to the suggestion in point 14.

Concerning point 8:

Concerning the claims 122, 125, 126, 144 see point 7.
Claim 127 is justified in connection with the invention in Claim 124.

Concerning point 10:

This is based on a misunderstanding about the edge 10, which is now described as an outer edge 28 more restrictively and more clearly.
Applicant objects to the assessment of the **claims 124 and 140**. Considering the new explanation of edge 10 as outer edge, the argumentation in the amendment dated 17th April 2003 is more than sufficient. Nevertheless Applicant wants to add some practical experience to underline how extraordinary the invention is.

Applicant has written several papers about this theme which have been reviewed by several scientists of the university (Scientific advisory board of specialist journals for electrical machines). The concept was not accepted as Applicant could not give any proofs for the high efficiency of the machine at that time. No one could image that an air gap machine like this could have a higher efficiency than machines which have iron-core coils (" Iron machines"). There is a big resistance to do without iron in a core to make a machine more efficient, because everyone is firmly fixed in their opinion that iron increases the tension by a factor of 1000-5000, as this is apparently proven by the μ_r (magnetic permeability) of iron to air. But this is just a distorted point of view. The benefits of the highly efficient coil utilization in general and with an axis approximation have been disputed as well, because the speed decreases with the radius and the conductor has to be prolongated for this. This argument has

been held up to Applicant during license negotiations with a manufacturer of bell-shaped machines. It has even been said that the output decreases in the fourth power to the radius. Such a lack of understanding and so little openness from specialists for this area – the decreasing of the speed has only a linear effect on current and tension. No one could imagine that avoiding a winding head and using only short conductors in the girth area of the machine leads to increasing the efficiency considerably. These are only a few examples that show how difficult it is, even for an expert, to accept this new concept, which is the basis for the patent application, and the respective machine. And these machines are not at all obvious for a person of ordinary skill.

Because of the many rejections Applicant has performed more detailed calculations which prove that, compared to common disc machines, an increased output of factor 11 can be reached with machine of the same diameter, only by using the machine in fig.1.
The active conductor parts increases by approx. 60% and compared to "iron machines" the losses of iron can be avoided as well. Machine substance can be saved and there are a couple of other advantages.
Using the short conductors in the girth area leads (as well as in Oba's machine) to an output increase of 100%, hardly believable for a person of ordinary skill.
An axis approximation of the winding in an axial cylinder machine leads to an increased performance of approx. 60% and an improvement of the coil utilization of approx. 60% with the same machine diameter. Increased performance or output means here that all components (conductor, magnetic material, machine surface, machine volume, relative speed, weight, energy imparted) can be used highly efficient.
Inventive machines reach the same performance as iron machine with the same machine size, but much better machine characteristics, which means considerably higher efficiency.

This may seem totally incredible to an average expert. Only with a proof these experts are willing to deal with this theme. An increase of efficiency by such an unusual and weird concept may seem rather strange to an average expert. Never would he have the idea to combine the systems of Oba and Rabe to make a highly efficient electrical machine, because the knowledge about machines and the direction in which machines developed in the past 100 years points against it.
The machine concept was developed further in the meantime and applied to the area of asynchronous machines as well. The results are so amazing that it is possible that this

machine concept will renew the whole area of electrical machines, as it is the most efficient form of an electrical machine in which the ideal conditions are realized 100%. (see also concerning point 11)

Concerning point 11:

Objection concerning the comment about 146 (old claim 105) (if this comment is about claim 146). To make things more clear the claim was formulated according to claim 146 with markings or claim 25 dated June 13, 2000.

From US-5289069 (Hasegawa) we know that within an air gap of an air gap machine magnetic poles can be positioned on one or both sides. The invention in claim 146 is not mainly the fact that magnetic poles are positioned on both sides of a coil backed with a return path , but that the magnet in the girth area of a disc machine additionally uses the conductors in the folded region. This invention was until now unknown and is not obvious at all (see concerning point 10). Oba's machine (JP 55-083,449) can not easily be extended with such an outside magnet, as the magnet does not have a facing return path (like in fig.8 the return path flat strip 9) in part 11, resp. the facing magnet (like part 6 in fig.8, of which the magnet is magnetized in direction of the girth). The lines of electric flux mentioned in claim 146 would face the girth-side face regions of the inner magnets where they can not penetrate. This means that more than one step of development is necessary to turn Oba's machine into the invention in claim 146. Either an inner return path ring (belonging to part 11) is necessary as shown in fig. 4,5,7, or a magnet which is magnetized in the direction of the girth area as shown in fig. 8 or fig. 14. Apart from that, the problem concerning the coil frame does not have to be solved which Oba places in the girth area. An inventive solution is shown in fig.3,4,5 with coil frame 21.

The invention in claim 146 is justified in connection claim 145 and 124.

Concerning point 12:

Applicant objects to the assessment of claim 153 and 154 as it is based on a misunderstanding. It is about the build of the machines in the claims 122 (new claim 165) and 124 (new claim 167) as rotating machines. (see Point 7 and 10)

Concerning point 13:

In claim 122 the edge 10 was (restrictively) specified as bordering and corner edge, so that claim 122 can be granted and refers to claim 157 with its builds.

Concerning point 14:

Applicant attaches enclosure 1 referred to in the amendment filed April 17, 2003. The reason for the misunderstanding can be the following: The outer edge of the air gap is meant, which means its outer border in section across the moving direction and not outer edge 28 of the boundary surface.

This misunderstanding (see also concerning point 10) shows that the generic claims are not disclosed in the patents of Rabe and Oba.

2. Further changes in the new claims 165-212

2.1. New claims have been added:

2.1.1 New Claim 169

A solution to the task is creating a highly efficient synchronous machine equipped with at least one air gap alternating current winding, so that the average and high performance area (e.g. vehicle drives for a new car generation) have a highly efficient machine (lightweight, compact, high performance, better braking action in the rotor) as well. The basis of this invention is described in the Specification on page 4, lines 6-14, page 10, line 31-33, page 11, line 1-2, page 22, line 10-12, line 18-21.

Alternating current winding are only known as groove windings in iron. These are then actuated with alternating current or rotary current, the rotating field actuates a synchronous or asynchronous machine. Alternating current winding are only known as groove windings in iron. Apart from that, only drum windings are used here, as the inserting in the grooves of a pancake coil is not only very hard to do, but also almost impossible. Due to the high losses (iron- and copper losses) the efficiency of machines like that is rather low and the characteristics of the machine leave much to be desired. The machine surface utilization is rather small, too. Due to the

necessary iron tooth it is not possible to coat the whole air gap surface with copper. You can see alternating current winding in figs. 2,11,25,28,30,32,37.

2.1.2 New Claim 170

Claim 170 describes a solution to the task. The bent and folded coils with several windings allow for a high performance at low number of revolutions, the girth area can be used highly efficient as one- or two-layered direct current winding. The winding head conductors, which are often too long in common drum windings, overlap in the axis-near area and are shortened extremely due to the axis approximation. The machine makes a high dynamic ratio as coil rotor possible, as the overlapping winding heads in the girth area are not necessary, which means the coil has a low moment of inertia. Due to the overlapping of the machine surface and pole surface are used efficiently.
Here, the state of the art is applicable which was described for claim 169. Apart from that, this claim is also applicable for direct current windings which are not used in this form and are a big step in development.
(Specification page 13, line 6-18, Figs. 10,11,12,13)

2.1.3. New Claim 171

A solution to the task is described in claim 171. Here, single conductor coils are bent or folded around at least one first body and are, starting from the girth, approximated to the axis or shaft generally V-shaped. This makes a highly efficient two-layered winding in the girth area, of which the conductors can run perfectly right-angled to the girth area. Inactive conductor parts can only be in the axis-near area of the coil. This way a slanted winding can be used in a disc machine highly efficient for the first time. This was not possible until now, as the active pole surface is reduced in simple pancake coils with slanted conductors and are mainly active in the axis-near area. In known disc machines this negative effect was reduced by choosing involute coil courses in the girth- and axis-near areas. But there is the same problem which was solved by this invention.

(Specification page 11, line 30-35, page 12, line 6-13, page 13, line 6-11, Figs. 14,15)

2.1.2. New Claim 172

The new claim 172 describes the machine in claim 169 with a rotary current winding or a traveling-wave winding.

(Specification page 10, line 31-33, page 11, line 1-2, Figs. 36-38, page 22, line 10-12)

2.1.3. New Claim 204

For claim 204 see description page 17, last paragraph to page 18, first paragraph.

2.2. Old claims have been changed:

2.2.1. Claim 212

Claim 212 was extended a bit more than claim 164. Basis is claim 82 and claim 119 as well as descriptions on page 22, line 5-14.

2.2.2. Claim 203, 209,173,

are changed to multiple dependent claims.

3. New Information from the European Patent Office

The claims presented herein have received favorable treatment at the European Patent Office, after misunderstandings regarding the invention were resolved.

Applicant respectfully submits that the new claims overcome the objections and rejections made by the Examiner and Applicant requests the Examiner to reconsider the rejections and to pass the application to issue.

Respectfully submitted,

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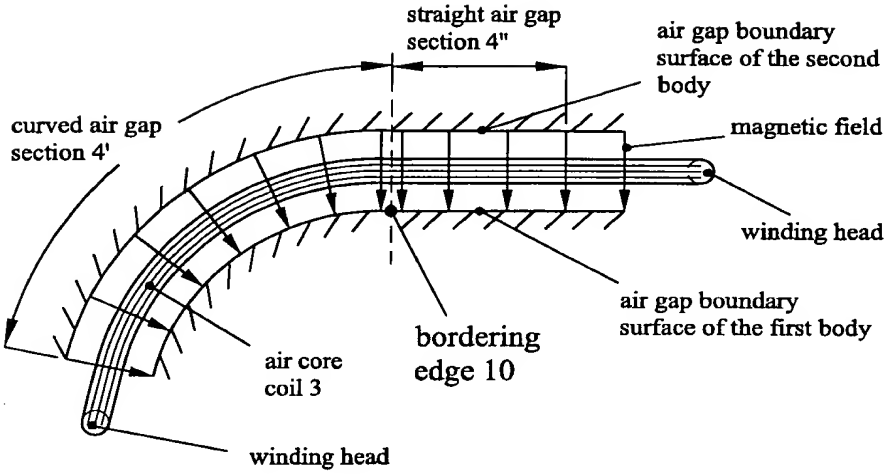
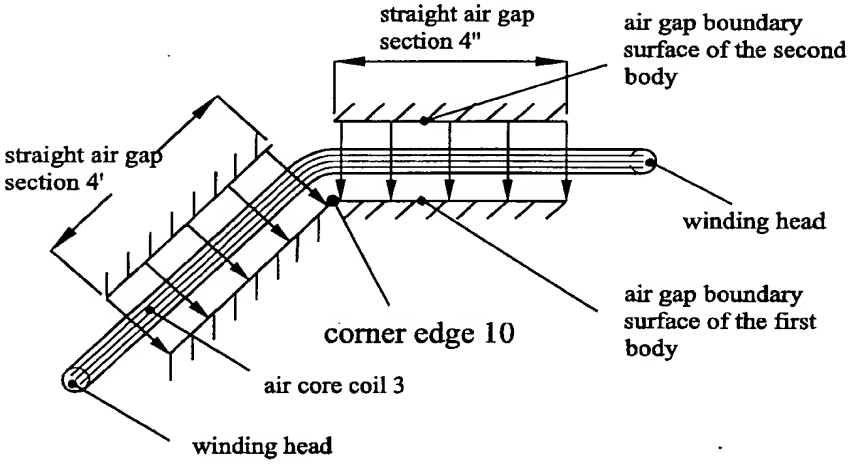
Enclosure 1

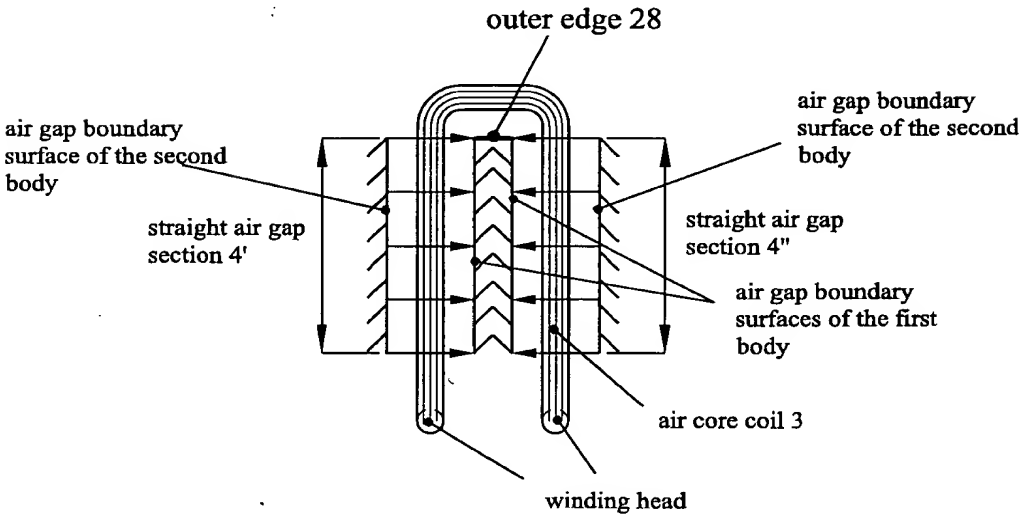
picture 1



picture 2



picture 3



The Table about the order of versions of electrical machines (the claims) to examine and there assign to the figures and the 16 groups

High Efficient Electrical machine according to:

I. Generic claim 165:

Generic claim 165 shows Fig.:	4,8,9,14 and (15), 22 and (23),24 and (25), 29 and (30), 31 and (32), 36 and (37,38), 39, 40, 41
Group:	1 only Fig.9, 2,4,7,9,10,11,13,14,16
1. Claim 203 ~~156~~ shows Fig.:	1 and (2), 3, 4, 5, 6, 7, 8, 9, 10 and (11), 12 and (13) ,14 and (15), (16), (17), 18 and (19), 20 and (21), 22 and (23), 24 and (25), 26, 27 and (28), 29 and (30), 31 and (32)
Group:	all
2. Claim 200 ~~153~~ shows Fig.:	no figure (1 and (2), 3, 5, 6, 7, 10 and (11), 12 and (13), (16), (17), 18 and (19), 20 and (21), 39)
Group:	no group
3. Claim 202 ~~155~~ shows Fig.:	4, 29 and (30), 31 and (32)
Group:	2, 13, 14
4. Claim 205 ~~157~~ shows Fig.:	4, 22 and (23), 24 and (25), 40, 41
Group:	2,9,10
5. Claim 206 ~~158~~ shows Fig.:	no figure
Group:	no group
6. Claim 209 ~~161~~ shows Fig.:	33 and (34,35), 36 and (37,38)
Group:	16
7. Claim 212 ~~164~~ shows Fig.:	36-38
Group:	16
8. Claim 179 ~~132~~ shows Fig.:	4, 22 and (23), 24 and (25), 29 and (30), 31 and (32), 40, 41

Group: 1 only Fig.9, 2, 9, 10, 13, 14

9. Claim 182 ~~135~~ shows Fig.: 4, 24 and (25), 29 and (30), 31 and (32), 40, 41
Group: 2,10

10. Claim 183 ~~136~~ shows Fig.: no figure
Group: no group

11. Claim 189 ~~142~~ shows Fig.: 4, 22 and (23), 29 and (30), 31 and (32), 40, 41
Group: 2, 9, 13, 14

12. Claim 190 ~~143~~ shows Fig.: 4, 29 and (30), 31 and (32)
Group: 2, 13,14

13. Claim 181 ~~134~~ shows Fig.: 8, 9, 14 and (15), 36 and (37,38), 39, 40, 41
Group: 4, 1 (only Fig.9), 7, 16

II. Generic claim 166:

Generic claim 166 shows Fig.: 8, 9, 14 and (15), 26, 36 and (37, 38), 39, 40, 41
Group: 4,7,11,16

1. Claim 203 ~~156~~ shows Fig.: 1 and (2), 3, 4, 5, 6, 7, 8, 9, 10 and (11), 12 and (13) ,14 and (15), (16), (17), 18 and (19), 20 and (21), 22 and (23), 24 and (25), 26, 27 and (28), 29 and (30), 31 and (32)
Group: all (without 16)

2. Claim 207 ~~159~~ shows Fig.: no figure
Group: no group

3. Claim 209 ~~161~~ shows Fig.: 33 and (34,35), 36 and (37,38)
Group: 16

4. Claim 211 ~~163~~ shows Fig.: no figure
Group: no group

5. Claim 212 ~~164~~ shows Fig.:	36-38
Group:	16
6. Claim 175 ~~128~~ shows Fig.:	8, 9, 14 and (15), 36 and (37,38), 39, 40, 41
Group:	4, 1 only Fig.9, 7, 16
7. Claim 176 ~~129~~ shows Fig.:	26
Group:	11
8. Claim 177 ~~130~~ shows Fig.:	26 (not exact)
Group:	11(not exact)
9. Claim 184 ~~137~~ shows Fig.:	29 and (30), 31 and (32)
Group:	13, 14
10. Claim 180 ~~133~~ shows Fig.:	8, 9, 14 and (15), 36 and (37,38), 39, 40, 41
Group:	4, 1 only Fig.9, 7, 16
11. Claim 178 ~~131~~ shows Fig.:	8, 9, 14 and (15), 26, 36 and (37,38), (1 and (2), 3, 4, 5, 6, 7, 10 and (11), 12 and (13), 16, 17, 18 and (19), 20 and (21), 22 and (23), 24 and (25), 27 and (28), 29 and (30), 31 and (32), 33 and (34,35), 39, 40, 41)
Group:	1 only Fig.9, 7,11,16 (all other)
12. Claim 196 ~~149~~ shows Fig.:	5, 14 and (15), 18 and (19), 22 and (23), 24 and (25), 31 and (32)
Group:	1 only Fig.5, 7, 9, 10, 14
13. Claim 195 ~~148~~ shows Fig.:	1 and (2), 3, 4, 5, 6, 7, 8, 9, 20 and (21), 27 and (28), 29 and (30), 31 and (32), 33 and (34,35), 36 and (37,38), 39, 40, 41
Group:	4, 16, (2, 3, 5, 6, 11, 12, 13, 15, 1 without Fig.5)

III. Generic claim 167:

Generic claim 167 shows Fig.:	1 and (2), 3, 5, 8, 9, 10 and (11), 12 and (13), 14 and (15), 18 and (19), 27 and (28), 33 and (34, 35), 36, and (37,38)
Group:	1,4,7, 12, 15, 16
1. Claim 203 ~~156~~ shows Fig.:	1 and (2), 3, 4, 5, 6, 7, 8, 9, 10 and (11), 12 and (13) ,14 and (15), (16), (17), 18 and (19), 20 and (21), 22 and

(23), 24 and (25), 26, 27 and (28), 29 and (30), 31 and (32)

Group: all

2. Claim 201 ~~154~~ shows Fig.: 1 and (2), 3, 5, 8, 9, 10 and (11), 12 and (13), 14 and (15), 18 and (19), 27 and (28)

Group: 1, 4, 7, 12

3. Claim 202 ~~155~~ shows Fig.: 4, 29 and (30), 31 and (32)

Group: 2, 13, 14

4. Claim 209 ~~161~~ shows Fig.: 33 and (34,35), 36 and (37,38)

Group: 16

5. Claim 173 ~~126~~ shows Fig.: 1 and (2), 3, 4, 5, 6, 7, 10 and (11), 18 and (19), 20 and (21), 27 and (28), 29 and (30), 31 and (32), 33 and 34 and (35), 36 and 37 and (38), 39, 40, 41

Group: 1, 2, 3, 4, 5, 8, 12, 13, 14, 15, 16

6. Claim 174 ~~127~~ shows Fig.: 11, 3, 5, 10 and (11), 18 and (19), 20 and (21), 27 and (28), 33 and (34, 35)

Group: 1,3,5,8,12,15

7. Claim 191 ~~144~~ shows Fig.: 8, 9, 14 and (15), 36 and (37,38), 39, 40, 41

Group: 1 only Fig.9, 4, 7, 16

8. Claim 192 ~~145~~ shows Fig.: 8, 14 and (15), 36 and (37, 38)

Group: 4, 7, 16 (here bended return path flat band)

9. Claim 193 ~~146~~ shows Fig.: 3, 5, 9, 18 and (19), 36 and (37, 38), 39, 40, 41

Group: 1,16

10. Claim 197 ~~150~~ shows Fig.: 1 and (2), 22 and (23), 24 and (25), 33 and (34,35), 36 and (37,38),

(3, 4, 5, 6, 7, 8, 9, 12 and (13), 18 and (19), 20 and (21))

Group: 1, 9, 10, 15, 16 (all other Figures)

11. Claim 198 ~~151~~ shows Fig.: 33 and (34,35), 36 and (37,38)

Group:	15,16
12. Claim 199 ~~152~~ shows Fig.:	1 and (2), 3, 5, 8, 9, 10 and (11), 12 and (13), 14 and (15), 18 and (19), 27 and (28)
	(4, 6, 7, 16, 17, 20, 21, 22, 23, 24, 25, 26, 29, 30, 31, 32)
Group:	1, 2, 3, 4, 5, 6, 7, 8, 12, (9, 10, 11, 13, 14)

IV. Generic claim 168:

Generic claim 168 shows Fig.:	27 and (28), 33 and (34, 35), 36 and (37, 38)
Group:	12, 15, 16
1. Claim 203 ~~156~~ shows Fig.:	1 and (2), 3, 4, 5, 6, 7, 8, 9, 10 and (11), 12 and (13) ,14 and (15), (16), (17), 18 and (19), 20 and (21), 22 and (23), 24 and (25), 26, 27 and (28), 29 and (30), 31 and (32)
Group:	all
2. Claim 208 ~~160~~ shows Fig.:	27 and (28), 29 and (30), 31 and (32)
Group:	12
3. Claim 209 ~~161~~ shows Fig.:	33 and (34,35), 36 and (37,38)
Group:	16
4. Claim 210 ~~162~~ shows Fig.:	33 and (34,35)
Group:	15
5. Claim 211 ~~163~~ shows Fig.:	no figure
Group:	no group
6. Claim 212 ~~164~~ shows Fig.:	36-38
Group:	16
7. Claim 173 ~~126~~ shows Fig.:	1 and (2), 3, 4, 5, 6, 7, 10 and (11), 18 and (19), 20 and (21), 27 and (28), 29 and (30), 31 and (32), 33 and 34 and (35), 36 and 37 and (38), 39, 40, 41
Group:	1, 2, 3, 4, 5, 8, 12, 13, 14, 15, 16

8. Claim 174 ~~127~~ shows Fig.: 11, 3, 5, 10 and (11), 18 and (19), 20 and (21), 27 and (28), 33 and (34, 35)

Group: 1,3,5,8,12,15

9. Claim 185 ~~138~~ shows Fig.: 29 and (30)

Group: 13

10. Claim 186 ~~139~~ shows Fig.: 31 and (32)

Group: 14

11. Claim 187 ~~140~~ shows Fig.: 27 and (28), 33 and (34,35), 36 and (37, 38),

(1 and (2), 3, (5, 6, 7, 8,9, 10 and (11), 12 and (13), 14 and (15), 18 and (19), 20 and (21), 39)

Group: 12, 15, 16

12. Claim 188 ~~141~~ shows Fig.: 8, 14 and (15), 36 and (37,38), 39, 40, 41

Group: 4, 7, 16

V. Generic claim 169:

Generic claim 169 shows Fig.: (1) and 2, (10) and 11, (18) and 19, (24) and 25, (27) and 28, (29) and 30, 31, 32, (36) and 37 and 38,

(3, 4, 5, 6, 7, 8, 9, 20 and 21)

Group: 1, 2, 3, 4, 5, 8, 10, 11, 12, 13, 14, 16

1. Claim 203 ~~156~~ shows Fig.: 1 and (2), 3, 4, 5, 6, 7, 8, 9, 10 and (11), 12 and (13) ,14 and (15), (16), (17), 18 and (19), 20 and (21), 22 and (23), 24 and (25), 26, 27 and (28), 29 and (30), 31 and (32)

Group: all

2. Claim 200 ~~153~~ shows Fig.: no figure (1 and (2), 3, 5, 6, 7, 10 and (11), 12 and (13), (16), (17), 18 and (19), 20 and (21), 39)

Group: no group

3. Claim 201 ~~154~~ shows Fig.: 1 and (2), 3, 5, 8, 9, 10 and (11), 12 and (13), 14 and (15), 18 and (19), 27 and (28)

Group: 1, 4, 7, 12

4. Claim 202 ~~155~~ shows Fig.: 4, 29 and (30), 31 and (32)

Group: 2, 13, 14

5. Claim 204 ~~164~~ shows Fig.: no figure
Group: no group

6. Claim 205 ~~157~~ shows Fig.: 4, 22 and (23), 24 and (25), 40, 41
Group: 2,9,10

7. Claim 206 ~~158~~ shows Fig.: no figure
Group: no group

8. Claim 207 ~~159~~ shows Fig.: no figure
Group: no group

9. Claim 208 ~~160~~ shows Fig.: 27 and (28), 29 and (30), 31 and (32)
Group: 12

10. Claim 209 ~~161~~ shows Fig.: 33 and (34,35), 36 and (37,38)
Group: 16

11. Claim 210 ~~162~~ shows Fig.: 33 and (34,35)
Group: 15

12. Claim 211 ~~163~~ shows Fig.: no figure
Group: no group

13. Claim 212 ~~164~~ shows Fig.: 36-38
Group: 16

14. Claim 173 ~~126~~ shows Fig.: 1 and (2), 3, 4, 5, 6, 7, 10 and (11), 18 and (19), 20 and (21), 27 and (28), 29 and (30), 31 and (32), 33 and 34 and (35), 36 and 37 and (38), 39, 40, 41
Group: 1, 2, 3, 4, 5, 8, 12, 13, 14, 15, 16

15. Claim 174 ~~127~~ shows Fig.: 11, 3, 5, 10 and (11), 18 and (19), 20 and (21), 27 and (28), 33 and (34, 35)
Group: 1,3,5,8,12,15

16. Claim 172 (new) shows Fig.: no figure
Group: no group

17. Claim 194 ~~147~~ shows Fig.: 6, 7
Group: 1, 2, 3, 4, 5, 6, 7, 8, 10 ,9 , 12, 15

VI. Generic claim 170:

Generic claim 170 shows Fig.: (10) and 11, (12) and 13
Group: 5, 6

1. Claim 203 ~~156~~ shows Fig.: 1 and (2), 3, 4, 5, 6, 7, 8, 9, 10 and (11), 12 and (13) ,14 and (15), (16), (17), 18 and (19), 20 and (21), 22 and (23), 24 and (25), 26, 27 and (28), 29 and (30), 31 and (32)
Group: all

2. Claim 200 ~~153~~ shows Fig.: no figure (1 and (2), 3, 5, 6, 7, 10 and (11), 12 and (13), (16), (17), 18 and (19), 20 and (21), 39)
Group: no group

3. Claim 201 ~~154~~ shows Fig.: 1 and (2), 3, 5, 8, 9, 10 and (11), 12 and (13), 14 and (15), 18 and (19), 27 and (28)
Group: 1, 4, 7, 12

4. Claim 202 ~~155~~ shows Fig.: 4, 29 and (30), 31 and (32)
Group: 2, 13, 14

5. Claim 204 ~~164~~ shows Fig.: no figure
Group: no group

6. Claim 205 ~~157~~ shows Fig.: 4, 22 and (23), 24 and (25), 40, 41
Group: 2,9,10

7. Claim 206 ~~158~~ shows Fig.: no figure
Group: no group

8. Claim 207 ~~159~~ shows Fig.: no figure
Group: no group

9. Claim 208 ~~160~~ shows Fig.: 27 and (28), 29 and (30), 31 and (32)
Group: 12

10. Claim 209 ~~161~~ shows Fig.: 33 and (34,35), 36 and (37,38)
Group: 16

11. Claim 210 ~~162~~ shows Fig.: 33 and (34,35)
Group: 15

12. Claim 211 ~~163~~ shows Fig.: no figure
Group: no group

13. Claim 212 ~~164~~ shows Fig.: 36-38
Group: 16

14. Claim 173 ~~126~~ shows Fig.: 1 and (2), 3, 4, 5, 6, 7, 10 and (11), 18 and (19), 20 and (21), 27 and (28), 29 and (30), 31 and (32), 33 and 34 and (35), 36 and 37 and (38), 39, 40, 41
Group: 1, 2, 3, 4, 5, 8, 12, 13, 14, 15, 16

15. Claim 174 ~~127~~ shows Fig.: 11, 3, 5, 10 and (11), 18 and (19), 20 and (21), 27 and (28), 33 and (34, 35)
Group: 1,3,5,8,12,15

16. Claim 172 (new) shows Fig.: no figure
Group: no group

17. Claim 194 ~~147~~ shows Fig.: 6, 7
Group: 1, 2, 3, 4, 5, 6, 7, 8, 10 ,9 , 12, 15

VII. Generic claim 171:

Generic claim 171 shows Fig.: (14) and 15
Group: 7

1. Claim 203 ~~156~~ shows Fig.: 1 and (2), 3, 4, 5, 6, 7, 8, 9, 10 and (11), 12 and (13) ,14 and (15), (16), (17), 18 and (19), 20 and (21), 22 and (23), 24 and (25), 26, 27 and (28), 29 and (30), 31 and (32)

   Group: all

2. Claim 200 ~~153~~ shows Fig.: no figure (1 and (2), 3, 5, 6, 7, 10 and (11), 12 and (13), (16), (17), 18 and (19), 20 and (21), 39)

   Group: no group

3. Claim 201 ~~154~~ shows Fig.: 1 and (2), 3, 5, 8, 9, 10 and (11), 12 and (13), 14 and (15), 18 and (19), 27 and (28)

   Group: 1, 4, 7, 12

4. Claim 202 ~~155~~ shows Fig.: 4, 29 and (30), 31 and (32)

   Group: 2, 13, 14

5. Claim 204 ~~164~~ shows Fig.: no figure

   Group: no group

6. Claim 205 ~~157~~ shows Fig.: 4, 22 and (23), 24 and (25), 40, 41

   Group: 2,9,10

7. Claim 206 ~~158~~ shows Fig.: no figure

   Group: no group

8. Claim 207 ~~159~~ shows Fig.: no figure

   Group: no group

9. Claim 208 ~~160~~ shows Fig.: 27 and (28), 29 and (30), 31 and (32)

   Group: 12

10. Claim 209 ~~161~~ shows Fig.: 33 and (34,35), 36 and (37,38)

    Group: 16

11. Claim 210 ~~162~~ shows Fig.: 33 and (34,35)

    Group: 15

12. Claim 211 ~~163~~ shows Fig.: no figure

Group: no group

13. Claim 212 ~~164~~ shows Fig.: 36-38
Group: 16

14. Claim 173 ~~126~~ shows Fig.: 1 and (2), 3, 4, 5, 6, 7, 10 and (11), 18 and (19), 20 and (21), 27 and (28), 29 and (30), 31 and (32), 33 and 34 and (35), 36 and 37 and (38), 39, 40, 41
Group: 1, 2, 3, 4, 5, 8, 12, 13, 14, 15, 16

15. Claim 174 ~~127~~ shows Fig.: 11, 3, 5, 10 and (11), 18 and (19), 20 and (21), 27 and (28), 33 and (34, 35)
Group: 1,3,5,8,12,15

16. Claim 172 (new) shows Fig.: no figure
Group: no group

17. Claim 194 ~~147~~ shows Fig.: 6, 7
Group: 1, 2, 3, 4, 5, 6, 7, 8, 10 ,9 , 12, 15

Enclosure 8

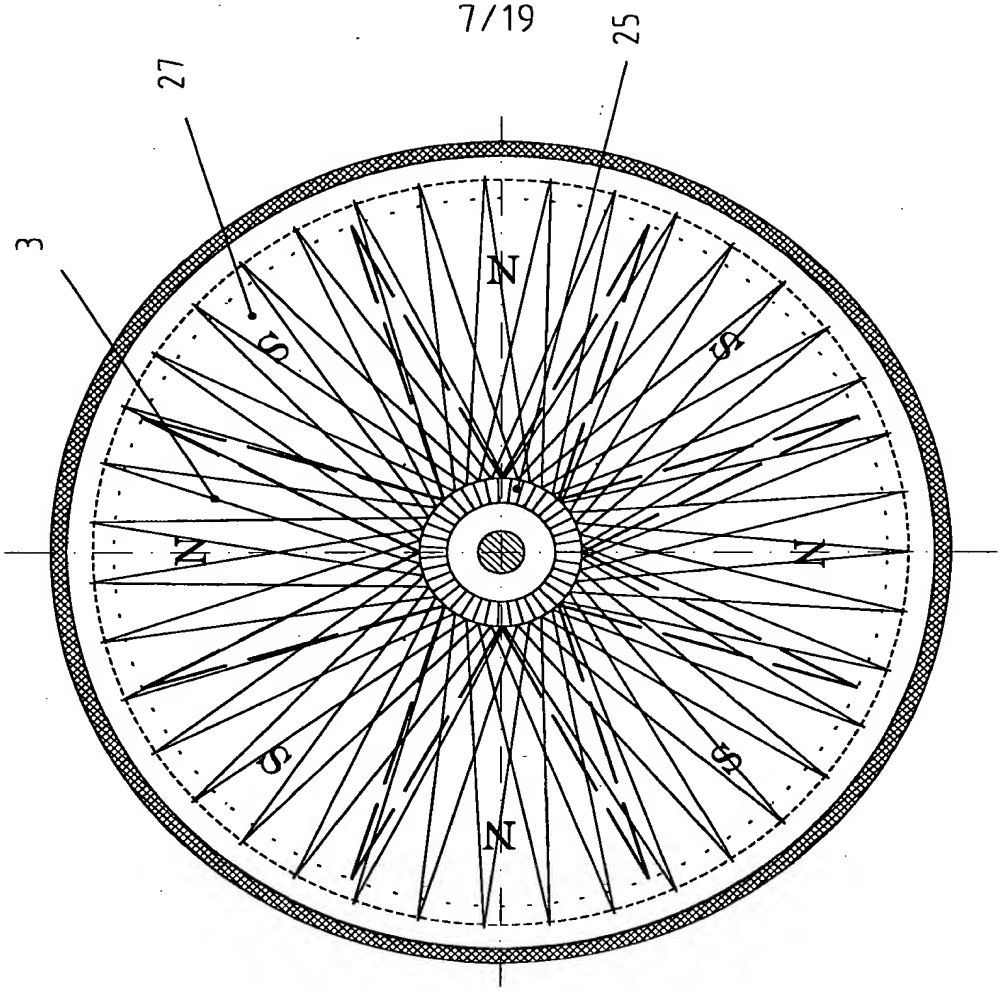


Fig.15

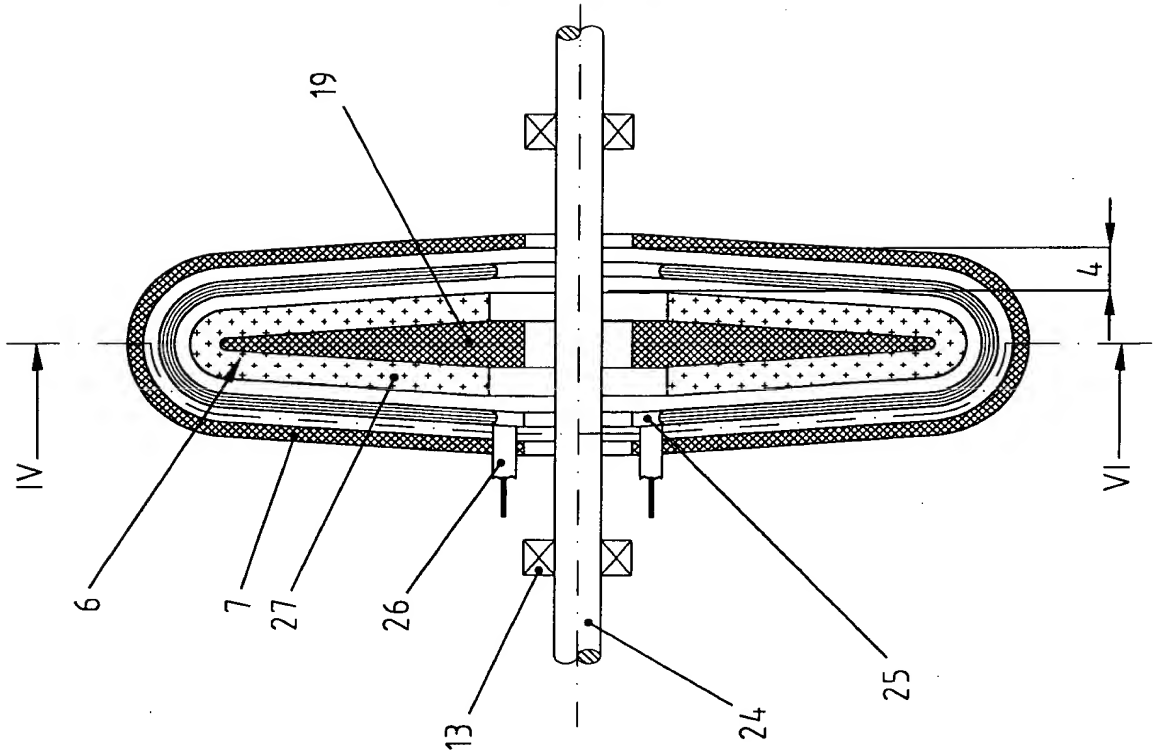


Fig.14

NEW CLAIMS ~~43-84 and 85-121~~ 122-164 from 4/17/2003

With markings

122. ~~43. (85)~~ An electrical machine comprising an air gap, delimited by a field device, in the form of at least two bodies at a distance from one another, with each one first body located neighboring one second body, and with magnetic poles, belonging to at least one of the facing sides of the first and second body, which are magnetized orthogonally to the air gap, extending essentially over the entire air gap transverse to a direction of movement, each as a whole or divided into partial poles, and backed with return path material, which alternate in the direction of movement, and whose field runs essentially in a straight line inside the pole surface region of each pole from one boundary surface of the air gap to the opposite boundary surface, which either also has magnetic poles or is comprised predominantly of return path material, and at least one two-pole air-core coil or a winding with two-pole air-core coils, which have no contact to return path material, extending, in section transverse to the direction of movement, into the air gap approximately in the middle and at an equal distance from the first and second bodies, moving relative to the field device and thereby each coil side of the at least one air-core coil traversing the direction of movement, and is connected at the outer edge of the air gap with another coil side directly or via predominantly inactive conductor or winding head conductor into at least one air-core coil,
wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections, ~~each two of which abut one another with~~ **that with one of** their air gap boundary surfaces belonging to the first body **lie at an angel to one another (claim 11, 15 (right translation), 32 from 13.6.00)** at the joint edge arising in this way, and each coil side of the at least one air-core coil runs through the air gap with its air gap sections, with each edge changing its geometric form and thereby completing a bend or fold around the first body and each coil side running essentially in the air gap **and every coil side stokes across both pole surface during relative moving (claim 85 from 30.10.02)**.

123. ~~44. (86)~~ An electrical machine comprising an air gap, delimited by a field device, in the form of at least two bodies at a distance from one another, with each one first body located neighboring one second body, and with magnetic poles, belonging to at least one of the facing sides of the first and second body, which are magnetized orthogonally to the air gap, extending essentially over the entire air gap transverse to a direction of movement, each as a whole or divided into partial poles, and backed with return path material, which alternate in the direction

of movement, and whose field runs essentially in a straight line inside the pole surface region of each pole from one boundary surface of the air gap to the opposite boundary surface, which either also has magnetic poles or is comprised predominantly of return path material, and at least one two-pole air-core coil or a winding with two-pole air-core coils, which have no contact to return path material, extending, in section transverse to the direction of movement, into the air gap approximately in the middle and at an equal distance from the first and second bodies, moving relative to the field device and thereby each coil side of the at least one air-core coil traversing the direction of movement, and is connected at the outer edge of the air gap with another coil side directly or via predominantly inactive conductor or winding head conductor into at least one air-core coil,

wherein the air gap, in section transverse to the direction of movement, comprises at least one curved air gap section, which is delimited by the inside of the first body **and outside of the second body** and in which **at least one curved air gap section** each coil side of the at least one air-core coil extends essentially along the full length of the curve, and the coil sides run through the air gap with its **at least one** air gap sections ~~and essentially in the air gap~~.

124. ~~45. (new)~~ An electrical machine comprising an air gap, delimited by a field device, in the form of at least two bodies at a distance from one another, with each one first body located neighboring one second body, and with magnetic poles, belonging to at least one of the facing sides of the first and second body, which are magnetized orthogonally to the air gap, extending essentially over the entire air gap transverse to a direction of movement, each as a whole or divided into partial poles, and backed with return path material, which alternate in the direction of movement, and whose field runs essentially in a straight line inside the pole surface region of each pole from one boundary surface of the air gap to the opposite boundary surface, which either also has magnetic poles or is comprised predominantly of return path material, and at least one two-pole air-core coil or a winding with two-pole air-core coils, which have no contact to return path material, extending, in section transverse to the direction of movement, into the air gap approximately in the middle and at an equal distance from the first and second bodies, moving relative to the field device and thereby each coil side of the at least one air-core coil traversing the direction of movement, and is connected at the outer edge of the air gap with another coil side directly or via predominantly inactive conductor or winding head conductor into at least one air-core coil,

wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections ~~lying close to one another, whose inner boundary surfaces approach~~

~~closely enough to each other on at least one side that they are connected by a short outer edge of the jointly delimited first body~~, and each coil side of the at least one coil runs through the air gap with the air gap sections and thereby each coil side completes one or more bends and/or folds around the ~~outer~~ edge of the first body, and each coil side essentially runs in the air gap and the folded region of the coil is penetrated to a large extent by the field, ~~in that in this part of the folded region at least one uniform and/or irregular air gap section delimits the conductor with magnetic poles affixed to at least one side.~~ **, in the folded region magnetic poles are positioned which are at least on one side opposite to the conductor and which are magnetized in the direction of the folded region. (claim. 62,65,66,67)**

125. ~~46. (new)~~ An electrical machine comprising an air gap, delimited by a field device, in the form of at least two bodies at a distance from one another, with each one first body located neighboring one second body, and with magnetic poles, belonging to at least one of the facing sides of the first and second body, which are magnetized orthogonally to the air gap, extending essentially over the entire air gap transverse to a direction of movement, each as a whole or divided into partial poles, and backed with return path material, which alternate in the direction of movement, and whose field runs essentially in a straight line inside the pole surface region of each pole from one boundary surface of the air gap to the opposite boundary surface, which either also has magnetic poles or is comprised predominantly of return path material, and at least one two-pole air-core coil or a winding with two-pole air-core coils, which have no contact to return path material, extending, in section transverse to the direction of movement, into the air gap approximately in the middle and at an equal distance from the first and second bodies, moving relative to the field device and thereby each coil side of the at least one air-core coil traversing the direction of movement, and is connected at the outer edge of the air gap with another coil side directly or via predominantly inactive conductor or winding head conductor into at least one air-core coil,

wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections lying close and **parallel** to one another, ~~whose inner boundary surfaces approach closely enough to each other on at least one side that they are connected by a short outer edge of the jointly delimited first body,~~ and each coil side of the at least one coil runs through the air gap with the air gap sections and thereby each coil side completes one or more bends and/or folds around the ~~outer~~ edge of the first body , and each coil side essentially runs in the air gap and all coil side sections of coil side within the respective air gap section are movable with essentially the same speed relative to the field device. (claim 95)

126. ~~47. (new)~~ An electrical machine according to claim 124 ~~45~~, wherein the at least two air gap sections, in section transverse to the direction of movement, lie parallel to one another, and their inner boundary surfaces delimit a uniformly narrow first body.

127. ~~48. (new)~~ An electrical machine according to claim 124 ~~45~~, wherein the inner boundary surfaces of the at least two air-core coil sections comprise at least predominantly return path material.

128. ~~49. (87)~~ An electrical machine according to claim 123 ~~43~~, wherein the air gap, in section transverse to the direction of movement, comprises at least one curved air gap section, which is delimited by the inside of the first body and ~~in which~~ **on the outside by the second body, where the at least one curved air gap section is disposed adjacent to at least one other air gap section and whose boundary surfaces pertaining to the first body either converge at least on one side such that they are connected that they abut directly on the thus formed common edge and that in the at least one curved air gap section and** each coil side of the at least one air-core coil extends essentially along the full length of the curve, and the coil sides run through the air gap with its air gap sections and essentially in the air gap, ~~and the at least one air gap section is in the shape of a circular arc.~~

129. ~~50. (88)~~ An electrical machine according to claim 123 ~~44~~, wherein, in section transverse to the direction of movement, the at least one curved air gap section is an irregular curve~~, and is elliptical~~.**(claim 88)**

130. ~~51. (89)~~ An electrical machine according to claim 129 ~~50~~, wherein, in section transverse to the direction of movement, the ~~elliptical~~ **irregular curved** air gap section is ~~a flat ellipse and thereby includes either one main apex and two secondary apexes or two main apexes and one secondary apex of the ellipse~~ **elliptical. (claim 89)**

131. ~~52. (90)~~ An electrical machine according to claim 123 ~~43~~, wherein the air-core coil is located essentially within the air gap.

132. ~~53. (91)~~ An electrical machine according to claim 122 ~~43~~, wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections, which, in section transverse to the direction of movement, are straight and lie at an angle of 90°

to one another, whereby they intersect at one of their boundary surfaces, belonging to the first body, forming an angular edge of the first body~~, which is rounded off~~.

133. ~~54. (92)~~ An electrical machine according to claim **123** ~~43~~, wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections which abut one another at a boundary surface which belongs to the first body, forming the edge, ~~or abut at the outer edge,~~ with one air gap section straight and one air gap section circularly curved.

134. ~~55. (93)~~ An electrical machine according to claim **123** ~~45~~, wherein, the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections ~~which transition directly into one another~~. **at least one of which is curved, abut with one of their boundary surfaces pertaining to the first body at an angle of 180° at the point of contact, thus forming a edge, where the inside boundary surface of the first body and the outside boundary surface of the second body verge directly into each other and each coil side extends in the full air gap and in the area of the bordering edge it runs completely in the air gap.**

135. ~~56. (94)~~ An electrical machine according to claim **122** ~~43~~, wherein, in section transverse to the direction of movement, the air gap is assembled from three air gap sections, with two straight air gap sections lying in parallel connected through a third air gap section, which is either straight and lies at a 90° angle to each of them ~~or is a curved air gap section~~.

136. ~~57. (95)~~ An electrical machine according to claim **122** ~~43~~, wherein the air gap, in section transverse to the direction of movement, comprises at least two **neighboring** air gap sections ~~lying in parallel~~, with the boundary surfaces which abut at an edge comprising predominantly return path material and belonging to a narrow ~~slot-shaped~~ first body **of uneven thickness** and the magnetic poles belonging to the air gap boundary surface of the second body.
(In the claims 43-84 the claim 57 was translated incorrectly due to a mix-up with claim 11 (also see claim 95 with markings). The correct translation is added in enclosure 2.)

137. ~~58. (96)~~ An electrical machine according to claim **123** ~~43~~, wherein, in section transverse to direction of movement, the air gap comprises several abutting air gap sections, ~~each two of which abut at an edge or at an outer edge,~~ which are straight or curved, and through which each

coil side of the at least one air-core coil runs, thereby completing at least one left bend and one right bend.

138. ~~59. (97)~~ An electrical machine according to claim **125** ~~58~~, wherein thereby at least three straight air gap sections lie, in section transverse to the direction of movement, parallel to one another **and each coil side of the at least one coil runs through the air gap with the air gap sections**.

139. ~~60. (98)~~ An electrical machine according to claim **125** ~~58~~, wherein the air gap, in section transverse to the direction of movement, comprises three straight air gap sections, with two air gap sections lying parallel to one another, and the third air gap section assuming an angle of 90° to them **and each coil side of the at least one coil runs through the air gap with the air gap sections**.

140. ~~61. (99)~~ An electrical machine according to claim **125** ~~43~~, wherein a conductor of the air-core coil in the folded region in the region of the edge ~~or outer edge~~ is ~~also at least partially~~ penetrated by the magnetic field, ~~with the magnetic field not running from one air gap boundary surface to the other in essentially a straight line~~.

141. ~~62. (100)~~ An electrical machine according to claim **124** ~~43~~, wherein, the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections which contain, in their boundary surfaces which belong to the first body and abut one another, magnetic partial poles which, out over the joint edge ~~or with an outer edge~~, form a joint continuous pole which is magnetized orthogonally to its air gap boundary surface.

142. ~~63. (101)~~ An electrical machine according to claim **122** ~~43~~, wherein, the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections, and the magnetic poles belong at least to different boundary surfaces of the air gap and the magnetic poles of the one air gap section, which belong to the boundary surface of the first body, lie with their faces at a distance to the return path material of the abutting, neighboring boundary surface of the other air gap section, which comprises at least predominantly return path material.

143. ~~64. (102)~~ An electrical machine according to claim **142** ~~56~~, wherein, in section transverse to the direction of movement, the air gap comprises at least three air gap sections, with two straight air gap sections lying in parallel connected by a straight third air gap section, and

magnetic poles belong to at least one of the two parallel boundary surfaces of the parallel air gap sections of the first body and are affixed to at least one of the sides of a slot-shaped return path body belonging to the first body and the boundary surface of the air gap section, which connects the two edges, in which one boundary surface of the air gap section abuts one of each of the air gap sections, comprises return path material and forms a flat return path of the first body, which is a return path flat band, which lies at a distance to the faces of the magnetic poles and is connected with the return path body approximately in the middle or on one edge, and an air gap boundary surface of the air gap section, to which magnetic poles belong, lies opposite to the return path flat band.

144. ~~65. (103)~~ An electrical machine according to claim **124** ~~45~~, wherein, in section transverse to the direction of movement, at least one second body in the folded region in the region of the edge ~~or outer edge~~ at least partially follows the conductor or a curved coil trace at a uniform distance.

145. ~~66. (104)~~ An electrical machine according to claim **124** ~~43~~, wherein at least one second body is connected via its edges lying in the direction of movement with a return path flat band which delimits the air gap on one side in the folded region in the region of an edge ~~or outer edge~~.

146. ~~67. (105)~~ An electrical machine according to claim **145** ~~66~~, wherein the return path flat band carries, on the side toward the air gap, magnetic poles which extend transverse to the direction of movement, alternate in the direction of movement, and are magnetized in the direction of the first body, in the direction of the edge ~~or outer edge~~.

147. ~~68. (106)~~ An electrical machine according to claim **124** ~~43~~, wherein it is composed of several machines which use a joint second body of the field device, which is implemented as a permanent magnet body, ~~with it magnetized orthogonally to the direction of movement and to the air gap boundary surface and with both of the two pole surfaces of the magnet body delimiting at least one air gap section of the two electrical machines~~.

148. ~~69. (107)~~ An electrical machine according to claim **123** ~~43~~, wherein, in section transverse to the direction of movement, first and second bodies are securely connected directly or via a body, which is a return path, at the outer edges of the opposing boundary surfaces of the air gap, with the second body having at least one continuous slot in the direction of movement, for leading through an coil support, which divides the air gap boundary surface of the second body

approximately in the middle in the direction of extension of the air gap and/or is located in a folded region of the at least one air-core coil.

149. ~~70. (108)~~ An electrical machine according to claim **124** ~~43~~, wherein, in section transverse to the direction of movement, first and second bodies are securely connected directly or via a body, ~~which is a return path,~~ at the outer edges of the opposing boundary surfaces of the air gap, with the second body delimiting the air gap opposite to the first body and the coil support connected at the other outer edge of the air gap with a winding head or an inactive conductor region of the at least one air-core coil and led out of the air gap region.

150. ~~71. (109)~~ An electrical machine according to claim **124** ~~43~~, wherein the field device is surrounded by a housing or is itself the housing or part of the housing, and either the at least one air-core coil is securely connected with a shaft or axle, with the field device journaled directly and/or via a housing, or the at least one air-core coil is journaled directly and/or via a coil support and/or via a housing on the shaft or axle , and the field device is thereby securely connected with the shaft or axle.

151. ~~72. (110)~~ An electrical machine according to claim **125** ~~43~~, wherein the movement is linear.

152. ~~73. (111)~~ An electrical machine according to claim **122** ~~43~~, wherein the movement of the field device and the at least one air-core coil is rotational relative to an axle or a shaft.

153. ~~74. (112)~~ An electrical machine according to claim **122** ~~57~~, wherein the field device, at least in the shape of at least three coaxial disk-shaped bodies lying at intervals, each as a disk or disk ring, is located on an axle or shaft with each one disk-shaped body located neighboring one second disk-shaped body, and these, in section transverse to the direction of movement, each delimiting one air gap section, whose boundary surfaces belonging to the first body abut at the ~~outer~~ edge of the first body **at an acute angle**, and magnetic poles belong to the second disk-shaped body on the side toward the air gap which are magnetized orthogonally to the air gap, extend in the direction of the axle, and alternate around the periphery, and at least one air-core coil, each coil side of which changes its geometric form at the ~~outer~~ edge, and which is bent or folded around the first body, with this being a very thin disk-shaped body, at least in its peripheral region, with boundary surfaces which predominantly comprise return path material, and a thin return path disk **of uneven thickness**, and each coil side on both sides of the first disk-shaped body extending into the air gap sections, approximately in the middle between each two

disk-shaped bodies and at equal distances from them, in the direction of the axle or shaft, and connected in its region nearest the axle with another coil side into an air-core coil, with the first and second disk-shaped bodies rotatable uniformly with one another and relative to the at least one air-core coil.

(The words „of uneven thickness" were added for better clarity. In the claims 43-84 the claim 74 was translated incorrectly. The correct translation is added in enclosure 3.)

154. ~~75. (new)~~ An electrical machine according to claim **124** ~~44~~, wherein the field device, at least in the shape of at least three coaxial disk-shaped bodies lying at intervals, each as a disk or disk ring, is located on an axle or shaft, with each one disk-shaped body located neighboring one second disk-shaped body, and these, in section transverse to the direction of movement, each delimiting one air gap section, **whose boundary surfaces belonging to the first body abut at the outer edge of the first body,** ~~whose boundary surfaces belonging to the first body approach one another on at least one side closely enough that they are connected by a short outer edge~~ and lie parallel to one another, and magnetic poles belong to the second disk-shaped body on the side toward the air gap which are magnetized orthogonally to the air gap, ~~axially~~, which extend in the direction of the axle, ~~radially~~, and which alternate around the periphery, and at least one air-core coil, each coil side **of which changes its geometric form at the ~~outer~~ edge, and which is bent or folded around the first body, with this being a very thin disk-shaped body,** ~~of which is bent or folded around the outer edge of the uniformly narrow cross-section of the first body,~~ with this being, at least in the peripheral region, a very thin disk-shaped body with boundary surfaces predominantly comprising return path material, and being a thin return path disk of uniform thickness, with each coil side extending outward from there on both sides of the first disk-shaped body in the direction of the axle or shaft, into each of the air gap sections approximately centrally between each two disk-shaped bodies at equal distances from them and connected there with another coil side into an air-core coil, with the first and second disk-shaped bodies rotatable uniformly with one another and relative to the at least one air-core coil, and a large part of the folded region of the coil is penetrated by the field~~, in that in this part of the folded region at least a uniform and/or irregular air gap section with magnetic poles affixed on at least one side delimits the conductor~~**, in the folded region magnetic poles are positioned which are at least on one side opposite to the conductor and which are magnetized in the direction of the folded region. (claim 62,65,66,67)**

155. ~~76. (113)~~ An electrical machine according to claim **122** ~~43~~, wherein the field device, at least in the shape of at least three coaxial disk-shaped bodies lying at intervals, each as a disk or

disk ring, is located on an axle or shaft, with each one disk-shaped body located neighboring one second disk-shaped body, and these, in section transverse to the direction of movement, each delimiting one air gap section, which each run on one side of the first disk-shaped body in the direction of the shaft or axle, and magnetic poles belong to at least one of the facing sides of the first and second disk-shaped bodies which are magnetized orthogonally to the air gap boundary surface, ~~axially,~~ which extend in the direction of the axle, ~~radially,~~ and which alternate around the periphery, with the first body comprising a slot-shaped return path body, which, in section transverse to the direction of movement, is very narrow, and magnetic poles which it carries on one of its sides, and the field device delimits a further air gap section in the peripheral region whose boundary surface belonging to the first body abuts each of the boundary surfaces also belonging to it of the neighboring air gap sections in each edge, and at least one air-core coil, with each coil side running at least partially through the air gap in the peripheral region and changing its geometric shape at both outer edges of the first body and bent or folded around the first body, extending outward from there on both sides of the first disk-shaped body in the direction of the axle or shaft, into each of the air gap sections approximately centrally between each two disk-shaped bodies at equal distances from them, and connected there with another coil side into an air-core coil, with the field device rotatable relative to at least one air-core coil and the first ~~and second disk-shaped bodies thereby moving uniformly with one another, and a field device delimiting an air gap at least partially encloses a conductor along its length in the folded region in the region of at least one edge of the at least one air-core coil.~~

156. ~~77. (114)~~ An electrical machine according to claim **123** ~~43~~, wherein the field device is located, at least in the form of at least two coaxial nested drum-shaped bodies at a distance from one another, on an axle or shaft, with each one first drum-shaped body located neighboring one second drum-shaped body and these, in section transverse to the direction of movement, each delimiting one air gap section, ~~with two straight air gap sections or~~ at least one straight and one curved air gap section or at least one curved air gap section forming the air gap, which approaches the axle or shaft in at least one region, with each coil side of the at least one air-core coil bent within at least one curved air gap section and/or changing its shape on at least one edge, at which each two neighboring air gap sections abut at their boundary surfaces belonging to the first body, ~~and/or on an outer edge~~ of the first body and bending or folding around the first body and extending over the entire air gap approximately centrally between the first and second body and at approximately equal distances from them, and the magnetic poles, which delimit the air gap and each air gap section on at least one side, are **preferably** magnetized orthogonally to their

air gap boundary surface, extend along the air gap in section transverse to the direction of movement, and alternate around the periphery, and the field device rotates relative to the at least one air-core coil, ~~with the first and second bodies of the field device securely connected and moving uniformly with one another.~~

157. ~~78. (115)~~ An electrical machine according to claim **122** ~~77~~, wherein the first drum-shaped body has the shape of a hollow or full circular cylinder and the second drum-shaped body has the shape of a hollow circular cylinder, with at least one of the facing shell sides of the first and second bodies, which delimit an air gap section, containing magnetic poles which are **preferably** radially magnetized and alternate around the periphery, and, in section transverse to the direction of movement, at least one of the facing sides of the first and second body, on the face **at least one side** of the first body, which delimits an air gap section, containing magnetic poles, which are magnetized orthogonally to the air gap boundary surface and axially and which alternate around the periphery, and the edge is formed by the abutting boundary surfaces of the shell and face sides of the air gap section belonging to the first body, which lie orthogonal to one another, each coil side of the at least one air-core coil is bent or folded around it and it extends from there outward into the air gap section on the shell side, ~~axially~~, and in the direction of the axle or shaft in the air gap section on the face side~~, preferably radially or radially projected~~.

158. ~~79. (116)~~ An electrical machine according to claim **122** ~~77~~, wherein the first drum-shaped body has the shape of a hollow or full circular cylinder and the second drum-shaped body has the shape of a hollow circular cylinder, with at least one of the facing shell sides of the first and second bodies, which delimit an air gap section, containing magnetic poles which are **preferably** radially magnetized and alternate around the periphery, and, in section transverse to the direction of movement, at least one of the facing faces of the first and second body, which delimit an air gap section ~~on one face of the first body and delimit an air gap section on its other face,~~ **on the face on the least one side of the first body,** containing magnetic poles, which are **preferably** magnetized orthogonally to the air gap boundary surface ~~and axially~~ and which alternate around the periphery, with the air gap sections **on the face**, in section transverse to the direction of movement, lying ~~orthogonally~~ **abtuse angle** to the air gap section **on the shell side**, and the boundary surfaces, belonging to the first body, of one air gap section on the shell side and one air gap section on the face, each abutting in an edge of the first body, around which each coil side of the at least one air-core coil is bent or folded and extends from there ~~preferably axially~~ into the air gap section on the shell side and ~~preferably radially or radially projected~~ into the air gap sections on the face, each in the direction of the axle or shaft.

159. ~~80. (117)~~ An electrical machine according to claim **123** ~~77~~, wherein the first drum-shaped body has the shape of a hollow or full circular cylinder and the second drum-shaped body has the shape of a hollow circular cylinder, with at least one of the facing shell sides of the first and second bodies, which delimit an air gap section, containing magnetic poles, which are **preferably** radially magnetized and alternate around the periphery, and the circular cylinder, in section transverse to the direction of movement, having faces ~~slanted or~~ bent inwards on at least one side toward the axle or shaft, with at least one of the facing faces of the first and second body, which delimits an air gap section on the face on at least one side of the first body, containing magnetic poles, which are **preferably** magnetized orthogonally ~~to the slanted or~~ along the bending radius and which alternate around the periphery, and at least one edge formed by the abutting boundary surfaces belonging to the first body of the air gap sections on the shell side and face, in which each coil side of the at least one air-core coil changes its geometric shape and is bent or folded around the first body during its course through the air gap and extends ~~preferably axially~~ into the air gap section on the shell side and into at least one air gap section on the face in the direction of the axle or shaft ~~and preferably radially projected~~.

160. ~~81. (118)~~ An electrical machine according to claim **125** ~~77~~, wherein the field device is in the form of at least three cylindrical bodies and the cylindrical body nearest the axle is a full or hollow cylinder and all further bodies are hollow cylinders and are nested in each other at a uniform interval at least on the shell side, with, in axial section, the boundary surfaces of one first body and one second body at a time delimiting one air gap section at a time, which each extend axially on the inner and outer shell surfaces of the first hollow cylinder, and at least one of the facing shell surfaces of the first and second cylindrical bodies has magnetic poles, which are **preferably** radially magnetized, extend axially, and alternate around the periphery, and **preferably** at least one of the facing faces of the first and second cylindrical bodies, which delimit an air gap section or a folded region on at least one side of the first body, also has magnetic poles, which are ~~axially magnetized~~, extend in the direction of the axle or shaft, and alternate around the periphery, and each coil side of the at least one air-core coil is bent around at least one **narrow** edge of a hollow cylindrical first body, which is formed by each two neighboring, abutting boundary surfaces of neighboring air gap sections ~~or is bent or folded around an outer edge of the, in section transverse to the direction of movement, relatively uniformly narrow cross-section of the hollow cylindrical first body~~ and extends ~~preferably axially~~ from there outward on both sides of the edge ~~or the outer edge of the, in the section transverse to the direction of movement, narrow cross-section of the hollow cylindrical first~~

~~body,~~ into an air gap section on the face or on one side at a time into an air gap section on the face in the direction of the axle or shaft, ~~radially or radially projected,~~ and on the other side into an air gap section on the shell side, ~~axially.~~

161. ~~82.(119)~~ An electrical machine according to claim **123** ~~43~~, wherein the field device comprises at least in the form of at least two long bodies, with each one first long body located neighboring one second long body, in section transverse to the direction of movement, and these each delimiting one air gap section, with **at least two** ~~straight air gap sections or~~ at least one straight and one curved air gap section or at least one curved air gap section forming the air gap, with each coil side of the at least one air-core coil bent in its course through the air gap around at least one first body within at least one curved air gap section and/or changing its geometric shape at at least one edge ~~and/or outer edge~~ of the long first body **in which each two neighboring air gap sections abut at their boundary surfaces (first Patent filing, see claim 119 with markings),** and bent or folded around the first body, and extending over the complete air gap approximately centrally between the first and second body and at approximately the same distance from each of them, and the magnetic poles, which delimit the air gap and each air gap section on at least one side, are **preferably** magnetized orthogonally to their air gap boundary surface, extend, in section transverse to the direction of movement, along the air gap, and alternate around the periphery, and the field device moves linearly relative to at least one air-core coil, ~~with the first and second bodies of the field device securely connected and moving together uniformly~~.

162. ~~83.(120)~~ An electrical machine according to claim **125** ~~82~~, wherein the long bodies are at least three long, plate-shaped bodies of a small, uniform thickness, which lie at uniform intervals from one another, with an air gap section located between each first plate-shaped body and second plate-shaped body, and the air gap sections lying parallel to one another in section transverse to the direction of movement, with the plate-shaped bodies being long relative to their width and the long sides lying in the direction of movement and magnetic poles belonging to at least one of the facing sides of the first and second plate-shaped bodies which extend transverse to the direction of movement and are magnetized orthogonally to the surface of the plate-shaped body delimiting the air gap, and the boundary surfaces belonging to the first body, which has, in section transverse to the direction of movement, a uniformly narrow surface, two neighboring air gap sections abut one another on one long side at the ~~outer~~ edge, around which each of the coil sides of the at least one air-core coil is bent or folded, and extends from this folded region into the air gap section, and is connected, in the region of the other opposite long edge of the first

plate-shaped body, with another coil side into an air-core coil, and the at least one air-core coil moves linearly relative to the field layout.

163. ~~84. (121)~~ An electrical machine according to claim **162** ~~82~~, wherein the first and second long bodies are connected with one another in the direction of movement at their beginning and their end by a body.

164. ~~out 82. and 119~~ **New** An electrical machine according to claim **122** ~~43~~, wherein the field device comprises at least in the form of at least two long bodies, with each one first long body located neighboring one second long body, in section transverse to the direction of movement, and these each delimiting one air gap section, with two straight air gap sections **witch lie at an angle of 90° to one another** ~~or at least one straight and one curved air gap section or at least one curved air gap section~~ forming the air gap, with each coil side of the at least one air-core coil bent in its course through the air gap around at least one first body within at least one curved air gap section and/or changing its geometric shape at at least one edge ~~and/or outer edge~~ of the long first body **in which each two neighboring air gap sections abut at their boundary surfaces (Erstanmeldung),** and bent or folded around the first body, and extending over the complete air gap approximately centrally between the first and second body and at approximately the same distance from each of them, and the magnetic poles, which delimit the air gap and each air gap section on at least one side, are **preferably** magnetized orthogonally to their air gap boundary surface, extend, in section transverse to the direction of movement, along the air gap, and alternate around the periphery, and the field device moves linearly relative to at least one air-core coil, ~~with the first and second bodies of the field device securely connected and moving together uniformly~~.

NEW CLAIMS ~~122-164~~ 165-212 from October 1, 2003

With markings

165. ~~122.~~ An electrical machine comprising an air gap, delimited by a field device, in the form of at least two bodies at a distance from one another, with each one first body located neighboring one second body, and with magnetic poles, belonging to at least one of the facing sides of the first and second body, which are magnetized orthogonally to the air gap, extending essentially over the entire air gap transverse to a direction of movement, each as a whole or divided into partial poles, and backed with return path material, which alternate in the direction of movement, and whose field runs essentially in a straight line inside the pole surface region of each pole from one boundary surface of the air gap to the opposite boundary surface, which either also has magnetic poles or is comprised predominantly of return path material, and at least one two-pole air-core coil or a winding with two-pole air-core coils, which have no contact to return path material, extending, in section transverse to the direction of movement, into the air gap approximately in the middle and at an equal distance from the first and second bodies, moving relative to the field device and thereby each coil side of the at least one air-core coil traversing the direction of movement, and is connected at the outer edge of the air gap with another coil side directly or via predominantly inactive conductor or winding head conductor into at least one air-core coil,
wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections, that with one of their air gap boundary surfaces belonging to the first body lie at an angel to one another at the joint **bordering edge or corner** edge arising in this way, and each coil side of the at least one air-core coil runs through the air gap with its air gap sections, with each edge changing its geometric form and thereby completing a bend or fold around the first body, and each coil side running essentially in the air gap**, the individual air gap section is straight or curved,** and every coil side stokes across both pole surface during relative moving.

166. ~~123.~~ An electrical machine comprising an air gap, delimited by a field device, in the form of at least two bodies at a distance from one another, with each one first body located neighboring one second body, and with magnetic poles, belonging to at least one of the facing sides of the first and second body, which are magnetized orthogonally to the air gap, extending essentially over the entire air gap transverse to a direction of movement, each as a whole or

divided into partial poles, and backed with return path material, which alternate in the direction of movement, and whose field runs essentially in a straight line inside the pole surface region of each pole from one boundary surface of the air gap to the opposite boundary surface, which either also has magnetic poles or is comprised predominantly of return path material, and at least one two-pole air-core coil or a winding with two-pole air-core coils, which have no contact to return path material, extending, in section transverse to the direction of movement, into the air gap approximately in the middle and at an equal distance from the first and second bodies, moving relative to the field device and thereby each coil side of the at least one air-core coil traversing the direction of movement, and is connected at the outer edge of the air gap with another coil side directly or via predominantly inactive conductor or winding head conductor into at least one air-core coil,
wherein the air gap, in section transverse to the direction of movement, comprises at least one curved air gap section, which is delimited by the inside of the first body and outside of the second body and in which at least one curved air gap section each coil side of the at least one air-core coil extends essentially along the full length of the curve, and the coil sides run through the air gap with its at least one air gap section.

167. ~~124.~~ An electrical machine comprising an air gap, delimited by a field device, in the form of at least two bodies at a distance from one another, with each one first body located neighboring one second body, and with magnetic poles, belonging to at least one of the facing sides of the first and second body, which are magnetized orthogonally to the air gap, extending essentially over the entire air gap transverse to a direction of movement, each as a whole or divided into partial poles, and backed with return path material, which alternate in the direction of movement, and whose field runs essentially in a straight line inside the pole surface region of each pole from one boundary surface of the air gap to the opposite boundary surface, which either also has magnetic poles or is comprised predominantly of return path material, and at least one two-pole air-core coil or a winding with two-pole air-core coils, which have no contact to return path material, extending, in section transverse to the direction of movement, into the air gap approximately in the middle and at an equal distance from the first and second bodies, moving relative to the field device and thereby each coil side of the at least one air-core coil traversing the direction of movement, and is connected at the outer edge of the air gap with another coil side directly or via predominantly inactive conductor or winding head conductor into at least one air-core coil,
wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections **lying close to one another, whose inner boundary surfaces**

approach closely enough to each other on at least one side that they are connected by a short outer edge of the jointly delimited first body, and each coil side of the at least one coil runs through the air gap with the air gap sections and thereby each coil side completes one or more bends and/or folds around the **outer** edge of the first body, and each coil side essentially runs in the air gap and the folded region of the coil is penetrated to a large extent by the field, **in that in this part of the folded region at least one uniform and/or irregular air gap section delimits the conductor with magnetic poles affixed to at least one side.** , ~~in the folded region magnetic poles are positioned which are at least on one side opposite to the conductor and which are magnetized in the direction of the folded region.~~ **and/or the outer edge forms a pole face having the same polarity with at least one boundary surface of the air gap sections pertaining to the first body.**
(claim 45 from 6/13/00, claims 124,100)

168. ~~125.~~ An electrical machine comprising an air gap, delimited by a field device, in the form of at least two bodies at a distance from one another, with each one first body located neighboring one second body, and with magnetic poles, belonging to at least one of the facing sides of the first and second body, which are magnetized orthogonally to the air gap, extending essentially over the entire air gap transverse to a direction of movement, each as a whole or divided into partial poles, and backed with return path material, which alternate in the direction of movement, and whose field runs essentially in a straight line inside the pole surface region of each pole from one boundary surface of the air gap to the opposite boundary surface, which either also has magnetic poles or is comprised predominantly of return path material, and at least one two-pole air-core coil or a winding with two-pole air-core coils, which have no contact to return path material, extending, in section transverse to the direction of movement, into the air gap approximately in the middle and at an equal distance from the first and second bodies, moving relative to the field device and thereby each coil side of the at least one air-core coil traversing the direction of movement, and is connected at the outer edge of the air gap with another coil side directly or via predominantly inactive conductor or winding head conductor into at least one air-core coil,
wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections lying close ~~and parallel~~ to one another, **whose inner boundary surfaces approach closely enough to each other on at least one side that they are connected by a short outer edge of the jointly delimited first body,** and each coil side of the at least one coil runs through the air gap with the air gap sections and thereby each coil side completes one or more bends and/or folds around the **outer** edge of the first body , and each coil side essentially

runs in the air gap and all coil side sections of coil side within the respective air gap section are movable with essentially the same speed relative to the field device.
(claim 125 with markings, claim 95)

169. **(NEW)** An electrical machine comprising an air gap, delimited by a field device, in the form of at least two bodies at a distance from one another, with each one first body located neighboring one second body, and with magnetic poles, belonging to at least one of the facing sides of the first and second body, which are magnetized orthogonally to the air gap, extending essentially over the entire air gap transverse to a direction of movement, each as a whole or divided into partial poles, and backed with return path material, which alternate in the direction of movement, and whose field runs essentially in a straight line inside the pole surface region of each pole from one boundary surface of the air gap to the opposite boundary surface, which either also has magnetic poles or is comprised predominantly of return path material, and at least one two-pole air-core coil or a winding with two-pole air-core coils, which have no contact to return path material, extending, in section transverse to the direction of movement, into the air gap approximately in the middle and at an equal distance from the first and second bodies, moving relative to the field device and thereby each coil side of the at least one air-core coil traversing the direction of movement, and is connected at the outer edge of the air gap with another coil side directly or via predominantly inactive conductor or winding head conductor into at least one air-core coil, (claim 35 from 6/13/00)
with two straight air gap sections or at least one straight and one curved air gap section or at least one curved air gap section forming the air gap, (claim 122)
and each coil side of the at least one air-core coil runs through the air gap with its air gap sections,
with each coil side of the at least one air-core coil bent within at least one curved air gap section and/or changing its shape on at least one edge, at which each two neighboring air gap sections abut at their boundary surfaces belonging to the first body, and/or on an outer edge of the first body and bending or folding around the first body and extending over the entire air gap approximately centrally between the first and second body and at approximately equal distances from them, and the magnetic poles, which delimit the air gap and each air gap section on at least one side, are magnetized orthogonally to their air gap boundary surface, extend along the air gap in section transverse to the **direction of movement**, and alternate around the periphery, and the field device ~~rotates~~ **moves** relative to the at least one air-core coil, with the first and second

bodies of the field device securely connected and moving uniformly with one another (claim 35 from 6/13/00)

and the winding consists of at least one alternating current winding.

(Claim 122, 156 with markings (claim 80))

The basis of this invention is described in the Specification on page 4, lines 6-14, page 10, line 31-33, page 11, line 1-2, page 22, line 10-12, line 18-21. You can see alternating current winding in fig.2,11,25,28,30,32,37.

170. **(NEW)** An electrical machine comprising an air gap, delimited by a field device, in the form of at least two bodies at a distance from one another, with each one first body located neighboring one second body, and with magnetic poles, belonging to at least one of the facing sides of the first and second body, which are magnetized orthogonally to the air gap, extending essentially over the entire air gap transverse to a direction of movement, each as a whole or divided into partial poles, and backed with return path material, which alternate in the direction of movement, and whose field runs essentially in a straight line inside the pole surface region of each pole from one boundary surface of the air gap to the opposite boundary surface, which either also has magnetic poles or is comprised predominantly of return path material, and at least one two-pole air-core coil or a winding with two-pole air-core coils, which have no contact to return path material, extending, in section transverse to the direction of movement, into the air gap approximately in the middle and at an equal distance from the first and second bodies, moving relative to the field device and thereby each coil side of the at least one air-core coil traversing the direction of movement, and is connected at the outer edge of the air gap with another coil side directly or via predominantly inactive conductor or winding head conductor into at least one air-core coil,

with two straight air gap sections or at least one straight and one curved air gap section or at least one curved air gap section forming the air gap,

and each coil side of the at least one air-core coil runs through the air gap with its air gap sections,

with each coil side of the at least one air-core coil bent within at least one curved air gap section and/or changing its shape on at least one edge, at which each two neighboring air gap sections abut at their boundary surfaces belonging to the first body, and/or on an outer edge of the first body and bending or folding around the first body and extending over the entire air gap approximately centrally between the first and second body and at approximately equal distances

from them, **and the movement is a rotating one around an axis or shaft** and the magnetic poles, which delimit the air gap and each air gap section on at least one side, are magnetized orthogonally to their air gap boundary surface, extend along the air gap in section transverse to the direction of movement, and alternate around the periphery, and the field device rotates relative to the at least one air-core coil, with the first and second bodies of the field device securely connected and moving uniformly with one another. **The winding consists of air coil overlapping each other (3) with several winding each, which run generally V-shaped from the girth area in direction of the axis or shaft as conductor bundle.**
(Specification page 13, line 6-18, Fig.10,11,12,13)

171. **(NEW)** An electrical machine comprising an air gap, delimited by a field device, in the form of at least two bodies at a distance from one another, with each one first body located neighboring one second body, and with magnetic poles, belonging to at least one of the facing sides of the first and second body, which are magnetized orthogonally to the air gap, extending essentially over the entire air gap transverse to a direction of movement, each as a whole or divided into partial poles, and backed with return path material, which alternate in the direction of movement, and whose field runs essentially in a straight line inside the pole surface region of each pole from one boundary surface of the air gap to the opposite boundary surface, which either also has magnetic poles or is comprised predominantly of return path material, and at least one two-pole air-core coil or a winding with two-pole air-core coils, which have no contact to return path material, extending, in section transverse to the direction of movement, into the air gap approximately in the middle and at an equal distance from the first and second bodies, moving relative to the field device and thereby each coil side of the at least one air-core coil traversing the direction of movement, and is connected at the outer edge of the air gap with another coil side directly or via predominantly inactive conductor or winding head conductor into at least one air-core coil,
with two straight air gap sections or at least one straight and one curved air gap section or at least one curved air gap section forming the air gap,
and each coil side of the at least one air-core coil runs through the air gap with its air gap sections,
with each coil side of the at least one air-core coil bent within at least one curved air gap section and/or changing its shape on at least one edge, at which each two neighboring air gap sections abut at their boundary surfaces belonging to the first body, and/or on an outer edge of the first

body and bending or folding around the first body and extending over the entire air gap approximately centrally between the first and second body and at approximately equal distances from them, **and the movement is a rotating one around an axis or shaft,** and the magnetic poles, which delimit the air gap and each air gap section on at least one side, are magnetized orthogonally to their air gap boundary surface, extend along the air gap in section transverse to the direction of movement, and alternate around the periphery, and the field device rotates relative to the at least one air-core coil, with the first and second bodies of the field device securely connected and moving uniformly with one another.

The winding is a direct current winding with air coils 3 which one winding each, which runs generally V-shaped from the periphery region in direction of the axis or shaft, the air coils overlapping each other and twisted relative to another in the direction of movement.

(Specification page 11, line 30-35, page 12, line 6-13, page 13, line 6-11, Fig.14,15)

172. (NEW) **Electrical machine according to claim 169, characteristic is that the winding consists of several alternating current windings, which together form a rotary current winding or a traveling wave winding.**

(Specification page 10, line 31-33, page 11, line 1-2, Fig.36-38, page 22, line 10-12)

173. ~~126.~~ An electrical machine according to claim **167, 168, 169, 170, 171** ~~124~~, wherein the at least two air gap sections, in section transverse to the direction of movement, lie parallel to one another, and their inner boundary surfaces delimit a uniformly narrow first body.

174. ~~127.~~ An electrical machine according to claim **173** ~~124~~, wherein the inner boundary surfaces of the at least two air-core coil sections comprise at least predominantly return path material.

175. ~~128.~~ An electrical machine according to claim **166** ~~123~~, wherein the air gap, in section transverse to the direction of movement, comprises at least one curved air gap section, which is delimited by the inside of the first body and on the outside by the second body, where the at least one curved air gap section is disposed adjacent to at least one other air gap section and whose boundary surfaces pertaining to the first body either converge at least on one side such that they are connected that they abut directly on the thus formed common **bordering edge or corner** edge and that in the at least one curved air gap section and each coil side of the at least one air-

core coil extends essentially along the full length of the curve, and the coil sides run through the air gap with its air gap sections and essentially in the air gap.

176. ~~129.~~ An electrical machine according to claim **166** ~~123~~, wherein, in section transverse to the direction of movement, the at least one curved air gap section is an irregular curve.

177. ~~130.~~ An electrical machine according to claim **176** ~~129~~, wherein, in section transverse to the direction of movement, the irregular curved air gap section is elliptical.

178. ~~131.~~ An electrical machine according to claim **166** ~~123~~, wherein the air-core coil is located essentially within the air gap.

179. ~~132.~~ An electrical machine according to claim **165** ~~122~~, wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections, which, in section transverse to the direction of movement, are straight and lie at an angle of 90° to one another, whereby they intersect at one of their boundary surfaces, belonging to the first body, forming an ~~angular~~ **corner** edge of the first body.

180. ~~133.~~ An electrical machine according to claim **166** ~~123~~, wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections which abut one another at a boundary surface which belongs to the first body, forming the **bordering edge or corner** edge, with one air gap section straight and one air gap section circularly curved.

181. ~~134.~~ An electrical machine according to claim **166** ~~123~~, wherein, the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections at least one of which is curved, abut with one of their boundary surfaces pertaining to the first body at an angle of 180° at the point of contact, thus forming a **bordering** edge, where the inside boundary surface of the first body and the outside boundary surface of the second body verge directly into each other and each coil side extends in the full air gap and in the area of the bordering edge it runs completely in the air gap.

182. ~~135.~~ An electrical machine according to claim **165** ~~122~~, wherein, in section transverse to the direction of movement, the air gap is assembled from three air gap sections, with two straight air gap sections lying in parallel connected through a third air gap section, which is either straight and lies at a 90° angle to each of them.

183. ~~136.~~ An electrical machine according to claim **165** ~~122~~, wherein the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections, with the boundary surfaces which abut at an **bordering edge or corner** edge comprising predominantly return path material and belonging to a narrow first body of uneven thickness and the magnetic poles belonging to the air gap boundary surface of the second body.

184. ~~137.~~ An electrical machine according to claim **165** ~~123~~, wherein, in section transverse to direction of movement, the air gap comprises several abutting air gap sections, **each two of which abut at an bordering edge or corner edge,** which are straight or curved, and through which each coil side of the at least one air-core coil runs, thereby completing at least one left bend and one right bend.
(claim 137 with markings or claim 58 and 96)

185. ~~138.~~ An electrical machine according to claim **138** ~~125~~, wherein thereby at least three straight air gap sections lie, in section transverse to the direction of movement, parallel to one another and each coil side of the at least one coil runs through the air gap with the air gap sections.

186. ~~139.~~ An electrical machine according to claim **168** ~~125~~, wherein the air gap, in section transverse to the direction of movement, comprises three straight air gap sections, with two air gap sections lying parallel to one another, and the third air gap section assuming an angle of 90° to them and each coil side of the at least one coil runs through the air gap with the air gap sections.

187. ~~140.~~ An electrical machine according to claim **168** ~~125~~, wherein a conductor of the air-core coil in the folded region in the region of the ~~edge or~~ **outer edge** is also **at least partially** penetrated by the magnetic field, **with the magnetic field not running from one air gap boundary surface to the other in essentially a straight line**.
(claim 140 with marking or claim 99 and 61)

188. ~~141.~~ An electrical machine according to claim **168** ~~124~~, wherein, the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections which contain, in their boundary surfaces which belong to the first body and abut one another, magnetic partial poles which, ~~out over the joint edge or~~ **with an outer edge**, form a joint continuous pole which is magnetized orthogonally to its air gap boundary surface.
(claim 141 with marking or claim 100 and 62)

189. ~~142.~~ An electrical machine according to claim **165** ~~122~~, wherein, the air gap, in section transverse to the direction of movement, comprises at least two neighboring air gap sections, and the magnetic poles belong at least to different boundary surfaces of the air gap and the magnetic poles of the one air gap section, which belong to the boundary surface of the first body, lie with their faces at a distance to the return path material of the abutting, neighboring boundary surface of the other air gap section, which comprises at least predominantly return path material.

190. ~~143.~~ An electrical machine according to claim **182** ~~142~~, wherein, in section transverse to the direction of movement, the air gap comprises at least three air gap sections, with two straight air gap sections lying in parallel connected by a straight third air gap section, and magnetic poles belong to at least one of the two parallel boundary surfaces of the parallel air gap sections of the first body and are affixed to at least one of the sides of a slot-shaped return path body belonging to the first body and the boundary surface of the air gap section, which connects the two **bordering edge or corner** edges, in which one boundary surface of the air gap section abuts one of each of the air gap sections, comprises return path material and forms a flat return path of the first body, which is a return path flat band, which lies at a distance to the faces of the magnetic poles and is connected with the return path body approximately in the middle or on one **bordering edge or corner** edge, and an air gap boundary surface of the air gap section, to which magnetic poles belong, lies opposite to the return path flat band.

191. ~~144.~~ An electrical machine according to claim **167** ~~124~~, wherein, in section transverse to the direction of movement, at least one second body in the folded region in the region of ~~the edge or~~ **outer edge** at least partially follows ~~the conductor or~~ a curved coil trace at a uniform distance. (claim 144 with markings or claim 103 and 65)

192. ~~145.~~ An electrical machine according to claim **167** ~~124~~, wherein at least one second body is connected via its edges lying in the direction of movement with a return path flat band which delimits the air gap on one side in the folded region in the region of an ~~edge or~~ **outer edge.**

193. ~~146.~~ An electrical machine according to claim **192** ~~145~~, wherein the return path flat band carries, on the side toward the air gap, magnetic poles which extend transverse to the direction of movement, alternate in the direction of movement, and are magnetized in the direction of the first body, in the direction of the ~~edge or~~ **outer edge**.

194. ~~147.~~ An electrical machine according to claim **169** ~~124~~, wherein it is composed of several machines which use a joint second body of the field device, which is implemented as a permanent magnet body.

195. ~~148.~~ An electrical machine according to claim **166** ~~123~~, wherein, in section transverse to the direction of movement, first and second bodies are securely connected directly or via a body, which is a return path, at the outer edges of the opposing boundary surfaces of the air gap, with the second body having at least one continuous slot in the direction of movement, for leading through an coil support, which divides the air gap boundary surface of the second body approximately in the middle in the direction of extension of the air gap and/or is located in a folded region of the at least one air-core coil.

196. ~~149.~~ An electrical machine according to claim **166** ~~124~~, wherein, in section transverse to the direction of movement, first and second bodies are securely connected directly or via a body, at the outer edges of the opposing boundary surfaces of the air gap, with the second body delimiting the air gap opposite to the first body and the coil support connected at the other outer edge of the air gap with a winding head or an inactive conductor region of the at least one air-core coil and led out of the air gap region.

197. ~~150.~~ An electrical machine according to claim **167** ~~124~~, wherein the field device is surrounded by a housing or is itself the housing or part of the housing, and either the at least one air-core coil is securely connected with a shaft or axle, with the field device journaled directly and/or via a housing, or the at least one air-core coil is journaled directly and/or via a coil support and/or via a housing on the shaft or axle , and the field device is thereby securely connected with the shaft or axle.

198. ~~151.~~ An electrical machine according to claim **167** ~~125~~, wherein the movement is linear.

199. ~~199.~~ An electrical machine according to claim **167** ~~122~~, wherein the movement of the field device and the at least one air-core coil is rotational relative to an axle or a shaft.

200. ~~153.~~ An electrical machine according to claim **203** ~~122~~, wherein the field device, at least in the shape of at least three coaxial disk-shaped bodies lying at intervals, each as a disk or disk ring, is located on an axle or shaft with each one disk-shaped body located neighboring one second disk-shaped body, and these, in section transverse to the direction of movement, each delimiting one air gap section, whose boundary surfaces belonging to the first body abut at the

bordering edge or corner edge of the first body at an acute angle, and magnetic poles belong to the second disk-shaped body on the side toward the air gap which are magnetized orthogonally to the air gap, extend in the direction of the axle, and alternate around the periphery, and at least one air-core coil, each coil side of which changes its geometric form at the **bordering edge or corner** edge, and which is bent or folded around the first body, with this being a very thin disk-shaped body, at least in its peripheral region, with boundary surfaces which predominantly comprise return path material, and a thin return path disk of uneven thickness, and each coil side on both sides of the first disk-shaped body extending into the air gap sections, approximately in the middle between each two disk-shaped bodies and at equal distances from them, in the direction of the axle or shaft, and connected in its region nearest the axle with another coil side into an air-core coil, with the first and second disk-shaped bodies rotatable uniformly with one another and relative to the at least one air-core coil.

201. ~~154.~~ An electrical machine according to claim **203** ~~124~~, wherein the field device, at least in the shape of at least three coaxial disk-shaped bodies lying at intervals, each as a disk or disk ring, is located on an axle or shaft, with each one disk-shaped body located neighboring one second disk-shaped body, and these, in section transverse to the direction of movement, each delimiting one air gap section~~, whose boundary surfaces belonging to the first body abut at the outer edge of the first body,~~ **whose boundary surfaces belonging to the first body approach one another on at least one side closely enough that they are connected by a short outer edge** and lie parallel to one another, and magnetic poles belong to the second disk-shaped body on the side toward the air gap which are magnetized orthogonally to the air gap, which extend in the direction of the axle, and which alternate around the periphery, and at least one air-core coil, each coil side of which changes its geometric form at the outer edge, and which is bent or folded around the first body, with this being a very thin disk-shaped body, with this being, at least in the peripheral region, a very thin disk-shaped body with boundary surfaces predominantly comprising return path material, and being a thin return path disk of uniform thickness, with each coil side extending outward from there on both sides of the first disk-shaped body in the direction of the axle or shaft, into each of the air gap sections approximately centrally between each two disk-shaped bodies at equal distances from them and connected there with another coil side into an air-core coil, with the first and second disk-shaped bodies rotatable uniformly with one another and relative to the at least one air-core coil, and a large part of the folded region of the coil is penetrated by the field, **in that in this part of the folded region at least a uniform and/or irregular air gap section with magnetic poles affixed on at least one side delimits the**

conductor ~~, in the folded region magnetic poles are positioned which are at least on one side opposite to the conductor and which are magnetized in the direction of the folded region.~~
(claim 154 with marking, claim 75, claim 34 from 6/13/00)

202. ~~155.~~ An electrical machine according to claim **203** ~~122~~, wherein the field device, at least in the shape of at least three coaxial disk-shaped bodies lying at intervals, each as a disk or disk ring, is located on an axle or shaft, with each one disk-shaped body located neighboring one second disk-shaped body, and these, in section transverse to the direction of movement, each delimiting one air gap section, which each run on one side of the first disk-shaped body in the direction of the shaft or axle, and magnetic poles belong to at least one of the facing sides of the first and second disk-shaped bodies which are magnetized orthogonally to the air gap boundary surface, which extend in the direction of the axle, and which alternate around the periphery, with the first body comprising a slot-shaped return path body, which, in section transverse to the direction of movement, is very narrow, and magnetic poles which it carries on one of its sides, and the field device delimits a further air gap section in the peripheral region whose boundary surface belonging to the first body abuts each of the boundary surfaces also belonging to it of the neighboring air gap sections in each **bordering edge or corner** edge, and at least one air-core coil, with each coil side running at least partially through the air gap in the peripheral region and changing its geometric shape at both ~~outer~~ **bordering edge or corner** edges of the first body and bent or folded around the first body, extending outward from there on both sides of the first disk-shaped body in the direction of the axle or shaft, into each of the air gap sections approximately centrally between each two disk-shaped bodies at equal distances from them, and connected there with another coil side into an air-core coil, with the field device rotatable relative to at least one air-core coil and the first.

203. ~~156.~~ An electrical machine according to claim **165, 166, 167, 168, 169, 170, 171** ~~123~~, wherein the field device is located, at least in the form of at least two coaxial nested drum-shaped bodies at a distance from one another, on an axle or shaft, with each one first drum-shaped body located neighboring one second drum-shaped body and these, in section transverse to the direction of movement, each delimiting one air gap section, **with two straight air gap sections or** at least one straight and one curved air gap section or at least one curved air gap section forming the air gap, which approaches ~~the~~ **an** axle or shaft in at least one region, with each coil side of the at least one air-core coil bent within at least one curved air gap section and/or changing its shape on at least one **bordering edge or corner** edge, at which each two neighboring air gap sections abut at their boundary surfaces belonging to the first body, **and/or**

on an outer edge of the first body and bending or folding around the first body and extending over the entire air gap approximately centrally between the first and second body and at approximately equal distances from them, and the magnetic poles, which delimit the air gap and each air gap section on at least one side, are preferably magnetized orthogonally to their air gap boundary surface, extend along the air gap in section transverse to the direction of movement, and alternate around the periphery, and the field device rotates relative to the at least one air-core coil.
(claim 156 with markings or claim 114 and 77, claim 35 from 6/13/00)

204. (NEW) Electrical machine according to claim 203, characteristic is that at least one first body is bent or folded around the air gap and, indepent from the second body, relatively movable to at least one air gap.

205. ~~157.~~ An electrical machine according to claim **203** ~~122~~, wherein the first drum-shaped body has the shape of a hollow or full circular cylinder and the second drum-shaped body has the shape of a hollow circular cylinder, with at least one of the facing shell sides of the first and second bodies, which delimit an air gap section, containing magnetic poles which are preferably radially magnetized and alternate around the periphery, and, in section transverse to the direction of movement, at least one of the facing sides of the first and second body, on the face at least one side of the first body, which delimits an air gap section, containing magnetic poles, which are magnetized orthogonally to the air gap boundary surface and axially and which alternate around the periphery, and the **corner** edge is formed by the abutting boundary surfaces of the shell and face sides of the air gap section belonging to the first body, which lie orthogonal to one another, each coil side of the at least one air-core coil is bent or folded around it and it extends from there outward into the air gap section on the shell side, and in the direction of the axle or shaft in the air gap section on the face side.
(claim 156)

206. ~~158.~~ An electrical machine according to claim **203** ~~122~~, wherein the first drum-shaped body has the shape of a hollow or full circular cylinder and the second drum-shaped body has the shape of a hollow circular cylinder, with at least one of the facing shell sides of the first and second bodies, which delimit an air gap section, containing magnetic poles which are preferably radially magnetized and alternate around the periphery, and, in section transverse to the direction of movement, at least one of the facing faces of the first and second body, which delimit an air gap section on the face on the least one side of the first body, containing magnetic poles, which

are preferably magnetized orthogonally to the air gap boundary surface and which alternate around the periphery, with the air gap sections on the face, in section transverse to the direction of movement, lying abtuse angle to the air gap section on the shell side, and the boundary surfaces, belonging to the first body, of one air gap section on the shell side and one air gap section on the face, each abutting in an **corner** edge of the first body, around which each coil side of the at least one air-core coil is bent or folded and extends from there into the air gap section on the shell side and into the air gap sections on the face, each in the direction of the axle or shaft.
(claim 156)

207. ~~156.~~ An electrical machine according to claim **203** ~~123~~, wherein the first drum-shaped body has the shape of a hollow or full circular cylinder and the second drum-shaped body has the shape of a hollow circular cylinder, with at least one of the facing shell sides of the first and second bodies, which delimit an air gap section, containing magnetic poles, which are preferably radially magnetized and alternate around the periphery, and the circular cylinder, in section transverse to the direction of movement, having faces bent inwards on at least one side toward the axle or shaft, with at least one of the facing faces of the first and second body, which delimits an air gap section on the face on at least one side of the first body, containing magnetic poles, which are preferably magnetized orthogonally along the bending radius and which alternate around the periphery, and at least one **bordering edge or corner** edge formed by the abutting boundary surfaces belonging to the first body of the air gap sections on the shell side and face, in which each coil side of the at least one air-core coil changes its geometric shape and is bent or folded around the first body during its course through the air gap and extends into the air gap section on the shell side and into at least one air gap section on the face in the direction of the axle or shaft.
(claim 156)

208. ~~160.~~ An electrical machine according to claim **203** ~~125~~, wherein the field device is in the form of at least three cylindrical bodies and the cylindrical body nearest the axle is a full or hollow cylinder and all further bodies are hollow cylinders and are nested in each other at a uniform interval at least on the shell side, with, in axial section, the boundary surfaces of one first body and one second body at a time delimiting one air gap section at a time, which each extend axially on the inner and outer shell surfaces of the first hollow cylinder, and at least one of the facing shell surfaces of the first and second cylindrical bodies has magnetic poles, which are preferably radially magnetized, extend axially, and alternate around the periphery, and

preferably at least one of the facing faces of the first and second cylindrical bodies, which delimit an air gap section or a folded region on at least one side of the first body, also has magnetic poles, which are, extend in the direction of the axle or shaft, and alternate around the periphery, and each coil side of the at least one air-core coil ~~is bent around at least one narrow edge of a hollow cylindrical first body, which is formed by each two neighboring, abutting boundary surfaces of neighboring air gap sections or~~ **is bent or folded around an outer edge of the, in section transverse to the direction of movement, relatively uniformly narrow cross-section of the hollow cylindrical first body** and extends from there outward on both sides of ~~the edge or~~ **the outer edge of ~~the~~ a, in the section transverse to the direction of movement, narrow cross-section of the hollow cylindrical first body,** into an air gap section on the face or on one side at a time into an air gap section on the face in the direction of the axle or shaft, and on the other side into an air gap section on the shell side.
(claim 160 with markings or claim 118 and 81, claim 39 from 6/13/00)

209. ~~161.~~ An electrical machine according to claim **165, 166, 167, 168, 169, 170, 171** ~~123~~, wherein the field device comprises at least in the form of at least two long bodies, with each one first long body located neighboring one second long body, in section transverse to the direction of movement, and these each delimiting one air gap section, with **two straight air gap sections or** at least one straight and one curved air gap section or at least one curved air gap section forming the air gap, with each coil side of the at least one air-core coil bent in its course through the air gap around at least one first body within at least one curved air gap section and/or changing its geometric shape at at least one **bordering edge or corner** edge **and/or outer edge** of the long first body in which each two neighboring air gap sections abut at their boundary surfaces, and bent or folded around the first body, and extending over the complete air gap approximately centrally between the first and second body and at approximately the same distance from each of them, and the magnetic poles, which delimit the air gap and each air gap section on at least one side, are preferably magnetized orthogonally to their air gap boundary surface, extend, in section transverse to the direction of movement, along the air gap, and alternate around the periphery, and the field device moves linearly relative to at least one air-core coil. (claim 40 from June 13, 2000)

210. ~~162.~~ An electrical machine according to claim **209** ~~125~~, wherein the long bodies are at least three long, plate-shaped bodies of a small, uniform thickness, which lie at uniform intervals from one another, with an air gap section located between each first plate-shaped body and second plate-shaped body, and the air gap sections lying parallel to one another in section

transverse to the direction of movement, with the plate-shaped bodies being long relative to their width and the long sides lying in the direction of movement and magnetic poles belonging to at least one of the facing sides of the first and second plate-shaped bodies which extend transverse to the direction of movement and are magnetized orthogonally to the surface of the plate-shaped body delimiting the air gap, and the boundary surfaces belonging to the first body, which has, in section transverse to the direction of movement, a uniformly narrow surface, two neighboring air gap sections abut one another on one long side at the **outer** edge, around which each of the coil sides of the at least one air-core coil is bent or folded, and extends from this folded region into the air gap section, and is connected, in the region of the other opposite long edge of the first plate-shaped body, with another coil side into an air-core coil, and the at least one air-core coil moves linearly relative to the field layout.
(Claim 163 with markings or claim 120 and 83, claim 41 from 6/13/00)

211. ~~163.~~ An electrical machine according to claim **210** ~~162~~, wherein the first and second long bodies are connected with one another in the direction of movement at their beginning and their end by a body.

212. ~~164.~~ An electrical machine according to claim **209** ~~122~~, wherein the field device comprises at least in the form of at least two long bodies, with each one first long body located neighboring one second long body, in section transverse to the direction of movement, and these each delimiting one air gap section, with two straight air gap sections ~~witch lie at an angle of 90° to one another~~ **or at least one straight and one curved air gap section or at least one curved air gap section** forming the air gap, with each coil side of the at least one air-core coil bent in its course through the air gap around at least one first body within at least one curved air gap section and/or changing its geometric shape at at least one **bordering edge or corner** edge of the long first body in which each two neighboring air gap sections abut at their boundary surfaces, and bent or folded around the first body, and extending over the complete air gap approximately centrally between the first and second body and at approximately the same distance from each of them, and the magnetic poles, which delimit the air gap and each air gap section on at least one side, are preferably magnetized orthogonally to their air gap boundary surface, extend, in section transverse to the direction of movement, along the air gap, and alternate around the periphery, and the field device moves linearly relative to at least one air-core coil.